DOCUMENT RESUME

ED 277 990 CS 008 641

AUTHOR	O'Hear, Michael F., Ed.; And Others
TITLE	Journal of College Reading and Learning, Volume XIX, 1986.
INSTITUTION	Western Coll. Reading and Learning Association.
PUB DATE	86
NOTE	137p.; Papers presented at the Annual Meeting of the Western College Reading and Learning Association (19th, Los Angeles, CA, March 20-23, 1986). For Volume XVIII, see ED 267 376.
AVAILABLE FROM	Western College Reading and Learning Association, P.O. Box 4576, Whittier, CA 90607 ($12.00).
PUB TYPE	Collected Works - Serials (022) -- Guides - Classroom Use - Guides (For Teachers) (052) -- Speeches/Conference Papers (150)
JOURNAL CIT	Journal of College Reading and Learning; v19 1986
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Higher Education; *Learning Processes; *Reading Instruction; Reading Research; *Reading Skills; *Study Skills; *Teaching Methods

ABSTRACT

Addressing issues on developmental education, instructional and learning methods, learning assistance and academic support, and reading and research, this issue of the Journal of College Reading and Learning includes the following articles: "Moving the Mountain to Mohammed: Study Skills Tutoring in the Residence Halls" (J. L. Rogers); "Memory Models: Perspectives for Study Skills Instruction" (P. Mulcahy); "General vs. Adjunct Reading/Study Skills Instruction for a College History Course" (M. K. Elliott and M. Fairbanks); "Creating a Hierarchy of Verbal Analogy Relationships: A Beginning" (J. N. Hopper); "Identifying Native American Learning Skills" (J. Wauters and others); "A Three-Dimensional Approach to Test-Taking Instruction" (S. U. Gibson); "Reading, Writing, and Reasoning for Health Science Majors" (P. Cervi and S. Schaefer); "Teaching of Problem Solving Skills" (S. Bosworth); "Prospects for Improving Higher Education" (C. Bogue); "Self-Efficacy and Reading Achievement" (D. D. Marsh and D. M. Penn); "Developmental Writing Courses: A Vehicle for Teaching Writing across the Disciplines" (R. Austin); "Reading Students' Invisible Texts: Evaluating Writing Processes" (B. Tomlinson and P. Mortensen); "Adjunct Coursework at San Jose State University" (D. Sanidad and others); "The Road Map: An Organizational Approach to Study-Reading Content Material" (M. B. Hess); and "Preparing for the Year 2001 Emerging Challenges: Opportunities for Renewal" (J. S. Green). A subject index is included. (JD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED277990

JOURNAL OF COLLEGE READING AND LEARNING

VOLUME XIX
1986

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

Editor
Michael F. O'Hear
Indiana University—Purdue University
Fort Wayne

Senior Editors
Virginia Schrauger
Central Oregon Community College
Norma Spaulding
San Jose State University

Editorial Advisory Committee
David Lemire
Unita County
School District No. One
Joseph Martinez
University of Albuquerque
Nancy V. Wood
University of Texas at El Paso
Vincent Orlando
Metropolitan State University
Jo-Ann Mullen
University of Northern Colorado
Jo Ann Carter-Wells
California State University
Fullerton

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Michael F. O'Hear

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CS 008641

©Copyright 1986 by Western College Reading and Learning Association

WESTERN COLLEGE READING AND LEARNING ASSOCIATION

READING
LEARNING ASSISTANCE
DEVELOPMENTAL EDUCATION
TUTORIAL SERVICES

WCRLA Officers 1986-87

President
Wes Brown
California State University, Hayward

President-Elect
Gwyn Enright
San Diego City College

Secretary
Jane Lehmann
Elgin Community College

Treasurer
Gladys Shaw
University of Texas, El Paso

Coordinator of State Directors
Susan Brown
New Mexico State University

Newsletter Editor
Jane Hopper
California State University, Fullerton

TABLE OF CONTENTS

Moving The Mountain to Mohammed:
Study Skills Tutoring in The Residence Halls 1
Judy L. Rogers

Memory Models:
Perspectives for Study Skills Instruction 12
Patricia Mulcahy

General vs. Adjunct Reading/Study Skills
Instruction for a College History Course 22
Mary K. Elliott, Marilyn Fairbanks

Creating A Hierarchy of Verbal Analogy Relationships:
A Beginning 30
Jane N. Hopper

Identifying Native American Learning Skills 36
Joan Wauters, Marci Matlock, V. Con Osborne

A Three-Dimensional Approach
To Test-Taking Instruction 51
Sandra U. Gibson

Reading, Writing, and Reasoning
for Health Science Majors 59
Pamela Cervi, Susan Schaefer

Teaching of Problem Solving Skills 64
Stefan Bosworth

Prospects for Improving Higher Education 70
Carol Bogue

Self-Efficacy and Reading Achievement 78
David D. Marsh, Diane M. Penn

Developmental Writing Courses: A Vehicle
for Teaching Writing Across the Disciplines 87
Rose Austin

Reading Students' Invisible Texts:
Evaluating Writing Processes 91
Barbara Tomlinson, Peter Mortensen

Adjunct Coursework at San Jose State University 99
Daniel Sanidad, Mary Ann Sanidad, Norma Spalding

The Road Map: An Organizational Approach
to Study-Reading Content Material 105
Mary B. Hess

Preparing for the Year 2001 Emerging Challenges:
Opportunities for Renewal 123
Jennie Spencer Green

Subject Index for Journal of College Reading and Learning:
Volume XIX 129

MOVING THE MOUNTAIN TO MOHAMMED: STUDY SKILLS TUTORING IN THE RESIDENCE HALLS

Judy L. Rogers
Miami University

The value of peers helping peers has been well documented in the educational literature (Newcomb, 1962; Brown, 1977; Bruffee, 1978; Ender, McCaffrey & Miller, 1979; Trimbur, 1983). In the college setting, undergraduate students are used as paraprofessional staff in counseling centers, career services offices, orientation programs, learning assistance centers, admissions offices, residence halls, and numerous other programs. The proliferation of the use of paraprofessional staff is due to the fact that it works well. Studies by Carkhuff and Truax (1965), Zunker and Brown (1966), and Brown (1977) found in general that paraprofessionals were just as effective as professionals (in some cases more so) in the delivery of counseling, advising and tutoring services to other undergraduates. Students trained in the helping skills can make a significant impact on the academic success and retention of other students.

At Miami University (Ohio), all of the services offered out of the Office of Learning Assistance (OLA) are peer delivered, either in the form of individual tutoring or workshops. OLA has adopted this system because we believe this is a most effective way to help students improve. This discussion will focus on one particular program of the Office of Learning Assistance, the assignment of study skills tutors (Peer Advisers) to freshman residence halls.

The initial impetus for making study skills tutors an integral part of the residence hall staff came from the already existing emphasis on "the freshman experience" at Miami University. Studies on student attrition indicate that retention begins in the freshman year (Lenning, Sauer & Beal, 1980; Beal & Noel, 1980). Consistently half of the students who fail to continue at a college or university will leave during or immediately following their freshman year. In accordance with conclusions from this research, Miami attempts to provide a campus atmosphere of warmth, friendliness and sincere caring through specific programs, particularly programs geared to freshmen (Hart & DeVestern, 1979). All new residential students (on this primarily residential campus) are required to live in the fourteen freshman halls, where the director of the hall, a master's level profes-

sional, is also each resident's academic adviser. The ratio of freshman hall peer staff to students is one to twenty, so staff know all students personally and can give them as much individual attention as possible. Further, faculty associates are identified for each hall so that students can get to know faculty on an informal basis. This is only a sampling of the programs geared to freshmen, but it demonstrates that the concept of placing peer advisers in the freshman halls fits well with the student services philosophy on campus.

Assigning tutors to the residence halls also fits with our knowledge of the issues and concerns facing the typical freshman. New students ask themselves: Can I make it in college? What is expected of me? How do I read a college textbook? How do I study for a cumulative exam? What do I include in my notes, and how do I fit all of my coursework and extracurricular activities into just twenty-four hours a day? The anxiety of adjusting to the demands of college can be eased by talking to other students who have been through freshman year and survived—students who can listen to a freshman's anxiety about making it through college courses and offer sound advice and successful study strategies for getting through the first year.

The role of peer advisers in residence halls is to identify the academic assistance needs of the residents and to address those needs through either study skills tutoring or referral to the appropriate service. Specifically, the responsibilities of peer advisers in the halls are:

1. To identify and tutor residents who need assistance in study skills.
2. To offer workshops within the residence halls on the topics of time management, listening and notetaking, test preparation and test anxiety, coping with competition, memory and concentration, stress management, etc.
3. To provide information about the services of OLA to both students and staff and to refer students, when appropriate, for tutoring in writing, math, reading, and any other subject. As liaison between students and OLA, the peer adviser has a thorough knowledge of OLA services and communicates those services to students who seek academic help or to staff who wish to make referrals.
4. To serve as consultant to the residence hall staff on issues concerning academic support.

Thus, instead of asking the students to come to the Office of Learning Assistance, OLA sends staff out to them so that workshops, tutoring, and other programming occur in the students' own campus home. In a study conducted in 1976, Kesselman found that only one out of three undergraduate students seeks advice from advisers, although ninety-five percent of these students consider dropping out at one time or another. This implies that getting students to use ad-

visory programs can be a problem, and it may explain why peer advisers often play such an important part in academic assistance and referral. At Miami, freshmen who might otherwise put off getting assistance, or worse, never ask for it because "the office" seems a foreboding place, now receive help in a non-threatening environment—in their own dorm from a person who looks and acts very much like themselves and who has most likely dealt with the same concerns at one time or another. The goal is to make the acquisition of effective study skills an integral part of the experience of each new student by bringing tutoring into the halls through paraprofessional staff.

Two crucial elements in creating a successful paraprofessional study skills program in the residence halls are (1) the training of the tutors, (2) the communication and evaluation that occurs between the learning assistance office and the residence hall program.

Training Paraprofessionals

"Training in how to tutor effectively is imperative," (Lenning, Sauer & Beal 1980, p. 35). This conclusion follows the researchers' contention that tutoring by peers, particularly in the basic skills, has been found to assist retention. The success of a peer program revolves around the quality of training. In the OLA program, selection as well as training are given significant attention.

The process for selecting the staff of peer advisers begins in the fall of each year. A committee of current peer advisers and professional staff establish the criteria for selection and develop application materials accordingly. The basic premise is much like Ender, McCaffrey, and Miller's (1979), that individuals possessing such personal characteristics as non-possessive warmth, interpersonal sensitivity, empathic understanding, and overt genuineness can rapidly be taught helping skills. Thus, the selection procedures, which include an application (Appendix A) and references as well as group and individual interviews, are aimed at identifying such persons.

Training the newly selected peer adviser staff is an on-going process consisting of a one-credit course, two retreats, and bi-weekly in-service sessions. After being hired in March, peer advisers begin their training course, EDT 310, "Methods in Tutoring Adults." The course schedule includes seven 120-minute class sessions, an all-day retreat, and an overnight campout. The purpose of the course is to train staff in listening and communication skills, to teach them study skills theory, to address the developmental issues significant for themselves and the students with whom they will work, and to build a sense of collegiality among the staff. After the peer advisers return from sum-

mer break, the semester begins with a two-day training session, which serves both as a review of their spring coursework and preparation for their imminent duties as study skills tutors. Regular staff meetings serve to maintain and augment their skills throughout the year. Topics for these staff meetings include: diagnosing reading problems; confronting irresponsible clients; making referrals; stereotyping: a barrier to successful tutoring; and presentation excellence.

A strong emphasis of the training is development of effective interviewing and communication skills. An adaptation of Ivey's (1971) microcounseling technique is used for this training. Briefly, microcounseling, or microtraining, is a system in which a complex skill is broken down into its basic behavioral elements and then taught to trainees through experiential and modeling techniques. For example, in teaching paraprofessionals attending behavior, OLA staff first put them through exercises in which they experience poor attending behavior. They are then shown a videotape of a study skills session in which the tutor does not attend well. Staff critique the videotape and discuss the elements of good attending behavior. The course instructor then models good attending behavior, and subsequently the trainees practice good attending behavior in role playing situations. The final step is to videotape the trainees in a role-playing study skills session and then review the tape providing feedback as to their attending behavior. The listening skills of reflection of content and feeling are taught in a similar way. Peer advisers are videotaped again each semester in order to monitor their skills and improve their effectiveness.

As peer advisers are also required to present numerous workshops, training in effective workshop preparation and delivery is also a focus of training. The development of our peer advisers' workshop skills is charted through the use of the "Workshop Effectiveness Index" (Appendix B), which is completed by participants at the end of each workshop. Peer advisers are encouraged to attend each other's workshops and to critique one another's performance as another way to continue to polish their skills.

To teach tutors study skills theory, OLA staff use *How to Study in College* by Walter Pauk (1984) and *Becoming a Master Student* by David B. Ellis (1984). Tutors are tested over this material and must achieve a score of 85% or higher to show that they have mastered the content. The culmination of training is the assignment of the peer advisers to respective freshman residence halls.

Tutoring in the Residence Halls

As stated previously, the mission of the peer advisers in the freshman residence halls is to identify and address, through both workshops and tutoring, the study skills needs of hall residents. In addition, peer advisers serve as study skills consultants and as a referral resource to both the students and staff of each freshman hall. A detailed description of the expectations and guidelines for the peer advisers' role in the residence halls is provided in Appendix C.

One of the primary requirements for a successful study skills program in the residence halls is rapport between residence hall staff and their assigned peer adviser. Each must have a clear understanding of the role of the peer adviser in the hall, and each party must *mutually* agree on the objectives to be achieved and the methods for doing so. At the beginning of each academic year, orientation sessions are conducted to acquaint new freshman advisers (hall directors) with the peer adviser program and to elicit hall staff input on ways peer advisers can best operate in the hall. Peer advisers must also be thoroughly versed in their responsibilities in the hall and be able to "sell" themselves to the director and residence assistant staff. Residence hall staff will not make referrals if they are unclear about what a peer adviser does or if they have doubts about the peer adviser's skills.

In addition to becoming well acquainted with the staff, each peer adviser must make every effort possible to get to know the residents in the assigned hall. Peer advisers must have several office hours per week in the hall (in addition to workshop presentations) to be available for individual advising of residents. In most cases, this advising in the hall serves as an initial study skills session with subsequent sessions scheduled between the student and peer adviser in the Study Skills Center or in the office. At the beginning of the year, these office hours are most often spent in meeting and getting to know the residents.

Finally, peer advisers must spend a good deal of time developing creative advertising flyers to attract residents to their workshops. This is essential for a successful program.

Summary

Miami University is strongly committed to making the freshman experience a positive one. Training paraprofessional tutors to provide study skills programming in the freshman halls has been a successful vehicle for providing new students with the tools they need to succeed in college. This method of peer support allows for much more

individual attention than is feasible from the professional staff in OLA. In a typical year, twenty peer advisers offer approximately 115 workshops to over 3,100 students. Many of those students follow up the workshops with individual study skills tutoring and thus get the help they might not otherwise have received had it been up to their own initiative to come to the Office of Learning Assistance for help. The initial contact with a peer helps overcome their reluctance to seek assistance.

Students, peer tutors, and residence hall staff alike consistently affirm, in the several forms of evaluation conducted each year, that the program is a success. However, the strongest endorsement for the peer tutoring program may lie in Miami's retention rate. Sixty-nine percent of the students who enter Miami as freshmen graduate from the institution after five years. The graduation rate after five years for a national sample of similar institutions (four year, public) is fifty-three percent (Beal & Noel, 1980). While placing peer tutors in the residence halls is not the only factor in Miami's ability to retain its students, peer advisers certainly contribute to the university's ability to quickly identify and address the learning support needs of new students—an ability which keeps many students successful in the institution.

REFERENCES

Beal, P., & Noel, L. (1980). *What works in student retention.* Iowa City: The American College Testing Program.

Brown, W.F. (1977). *Student-to-student counseling: An approach to academic achievement* (rev. ed.). Austin, TX: Hogg Foundation Press.

Bruffee, K. A. (1978). The Brooklyn plan: Attaining intellectual growth through peer-group tutoring. *Liberal Education, 64,* 447-468.

Carkhuff, R. R., & Truax, C. B. (1965). Training in counseling and psychotherapy. *Journal of Consulting Psychology, 29,* 333-336.

Ellis, D. B. (1984). *Becoming a master student.* Rapid City, SD: College Survival, Inc.

Ender, S. C., McCaffrey, S. S., & Miller, T. K. (1979). *Students helping students.* Athens, GA: Student Development Associates.

Hart, D., & DeVestern, D. (1979, March). *Focus on freshmen for retention.* Paper presented at the annual convenion of the American College Personnel Association, Los Angeles, CA.

Ivey, A. (1971). *Microcounseling: Innovations in interviewing training.* Springfield, IL: Charles C. Thomas.

Kesselman, R. (1976, May). The care and feeding of stop-outs. *Change*, 13-15.

Lenning, O. T., Sauer, K., & Beal, P. E. (1980). *Student retention strategies* (AAHE-ERIC/Higher Education Research Report No. 8). Washington, D. C.: American Assoc. For Higher Education, *4*, 14.

Newcomb, T. M. (1962). Student peer-group influence and intellectual outcomes of college experience. In R. L. Sutherland, W. H. Holltzman, E. A. Koile, & B. K. Smith (Eds.), *Personality factors on the college campus* (pp. 69-91). Austin, TX: University of Texas, Hogg Foundation for Mental Health.

Pauk, W. (1984). *How to study in college* (3rd ed.). Boston: Houghton, Mifflin.

Trimbur, J. (1983, May). Peer tutors and the benefits of collaborative learning. *Writing Lab Newsletter, 7*(9), 1-3.

Zunker, V. G., & Brown, W. F. (1966). Comparative effectiveness of student and professional counselors. *Personnel and Guidance Journal, 44*, 738-743.

APPENDIX A

PEER ADVISER APPLICATION FALL 1985
OFFICE OF LEARNING ASSISTANCE, 100 MCGUFFEY, 4157

Note: Students hired as peer advisers must be prepared to work a minimum of two semesters in addition to a semester of training.

Application due: December 13, 1985, 5:00 p.m.

NAME:

EXPECTED DATE OF GRADUATION:

CAMPUS ADDRESS: PHONE:

MAJOR: WORKSTUDY: (circle one) yes no

HOME ADDRESS: PHONE:

G.P.A. (Minimum of 2.5 is required):

Please take care in completing this application. Be explicit and concise in your answers, as they are the sole basis for selecting

applicants for interviews. Use your own paper and staple the answers to the application form.

1. a. What motivated you to apply to be a Peer Adviser?
   b. Relate two or three qualities you possess which would make you a good Peer Adviser; cite specific examples of how you have demonstrated these qualities.
2. a. List the activities you are or have been involved in. (Star the ones you will continue to be in next year.)
   b. Describe the significant skills you have gained from these activities.
3. Describe a situation you have found to be initially difficult or unpleasant, and tell how you went about dealing with it, or adapting to it.
4. Relate an instance in which you have personally aided someone in need. Why did you become involved? What, if anything, made the problem difficult to resolve?
5. How would you assess your insight into the needs and experiences of people from other cultural or racial backgrounds? Please integrate your own personal experiences, if possible.

APPENDIX B
WORKSHOP EFFECTIVENESS INDEX*

We need your help to improve the quality of the workshops delivered by our staff. Below are rating scales for you to evaluate the effectiveness of your workshop's presenter. Please consider each rating carefully and circle the number you feel is appropriate.

	LOW	MEDIUM	HIGH
	1 2	3 4 5	6 7
Eye Contact	Avoids eye contact; dull or bored look.	Moderately good eye contact; seems interested and occasionally quite animated.	Maintains excellent and constant eye contact without staring.
	1 2	3 4 5	6 7
Gestures, Movement	Stationary; rigid; infrequent movement or use of gestures	Steady pace of gestures; moves freely, not self-conscious.	Demonstrative movement and gestures; use of movement invites attention.
	1 2	3 4 5	6 7
Use of Language	Little descriptive language; dry and technical.	Moderately descriptive and easy to listen to.	Highly descriptive; great variety; very involving
	1 2	3 4 5	6 7
Vocal Delivery	Monotone; poor articulation; reads from notes.	Pleasant variety in inflection; good articulation; good use of notes.	Dynamic speaker; great articulation; rarely refers to notes.

	1 2	3 4 5	6 7
Preparation	Appears badly organized erratic in topic; unclear.	Moves from one topic to next both logically and smoothly; provides good examples; very clear.	Extremely effective organization; unfaltering and constant.
	1 2	3 4 5	6 7
Relevance	Makes presentation without determining audience needs.	Responsive to audience; adapts presentation to fit audience's needs.	Presentation based upon audience input; very adaptable
	1 2	3 4 5	6 7
Audience Involvement	Lectures; does not encourage questions. No involvement of audience.	Good discussion format; openly invites questions; encourages audience to apply workshop principles to themselves.	Workshop completely involves audience; workshop made easily relevant.
	1 2	3 4 5	6 7
Overall Effectiveness	Very ineffective.	Effective and interesting.	Extremely effective.

Please feel free to write below any comments you may have.

Thank you for taking the time to complete the above questionnaire. With your ratings and comments, we hope to be able to improve the quality of our workshops in order to better meet your needs.

*Adapted, in part, from "Enthusiasm Awareness Index," Patricia Sanders, Associate Professor, Central Connecticut State University, New Britain.

APPENDIX C
PEER ADVISERS IN THE RESIDENCE HALLS
Expectations and Guidelines

I. Responsibilities of Peer Advisers in Residence Halls

1. To provide study skills to residents while tutoring.
2. To offer workshops in the residence hall on the topics of time management, test-taking strategies, listening and notetaking, memory and concentration, stress management, coping with competition, etc.
3. To serve as liaison between the Office of Learning Assistance and the residence hall staff and residents.
4. To serve as a consultant to the residence hall staff on issues concerning academic support.

II. Initial Contact with Hall

1. Contact the Freshman Adviser (Hall Director) before classes begin in the fall. Usually this will entail calling on or before the Sunday just prior to classes. Set up a time to meet with your Freshman Adviser in the hall. Thus, you can establish a solid footing for your work in the hall, and as a member of the hall staff, you can receive feedback on your work throughout the year.
   a. If the Freshman Adviser is not apprised of your job, discuss your responsibilities to the hall as a representative of the Office of Learning Assistance (OLA).
   b. Work with the Adviser to find a suitable location for you in the hall. Discuss when and where you should hold office hours and where you may post workshop notices.
   c. Discuss your attending hall staff meetings. Stress that you want to be considered a hall staff member and that you want to be kept up to date with what is happening in the hall.
   d. Discuss the possibility of walking through the halls without an escort if you are in a hall whose residents are of the opposite sex.
   e. Discuss attending an all-hall meeting with Freshman Adviser so as to introduce yourself and present to the residents information about OLA and your role in the hall.

III. After Classes Begin.

1. Attend initial staff meetings in order to get reacquainted.
2. Talk to Student Resident Assistants (R.A.'s) about the possibility of attending their corridor meetings so that you can describe in detail to the residents your role as a Peer Adviser. Take OLA printed matter (the flyers which include your name and phone; include your hall office hours).
3. Set up a hall workshop within the first three to four weeks of classes. A Time Management or General Study Skills workshop is a good one to begin the year.
4. Spend time during initial office hours getting to know residents and staff.
5. Spend additional time with staff (i.e., go to dinner together, drop by the hall occasionally to talk, etc.).

IV. Relations with R.A. Staff

This is the key to a positive experience in your residence hall. The hall staff is an important referral service for our office. You will learn as much about your hall as your R.A.'s will about OLA's services.

Always stress that you are a referral source and will help them in any way you can. You should let your R.A.'s know that you are there as a referral for academic support service, and you will not duplicate their work as resident assistants. In addition, be supportive of what they do. R.A.'s are under immense pressure and will appreciate an understanding ear. As an out-of-hall staff member, you can provide support for them too.

Having a social function for your R.A.'s or attending theirs can be fun and good for morale — sorry, they are not paid activities.

V. Office Hours

1. A minimum of two hours a week should be reserved for office hours in the hall in the place designated for you (lobby, mail room, or adviser's suite) by the Freshman Adviser. Be faithful and regular in keeping your designated hours.
2. Have on hand a selection of study skills handouts.
3. Keep a record of who came to see you so you can contact them later to see how things are going.
4. If students do not come to see you, mingle more with residents and staff.
5. Have a designated place for residents to leave messages for you, since there may be students who cannot see you during your office hours. Post your advertisements for upcoming workshops.

VI. Miscellaneous

1. Your supervisors and fellow peer advisers are the best sources of help if you encounter any problems. Don't be afraid to consult someone if you need advice or have any questions.
2. Expect and be prepared for any problems — ranging from academic to personal matters.
3. Invite some of the residents to study together and then go uptown together.
4. Try sitting your office hours in a corridor, not at the bell desk or in the lobby. Arrange this with your R.A.'s so you can get "around" those people in the hall that the R.A. would like you to meet.

MEMORY MODELS: PERSPECTIVES FOR STUDY SKILLS INSTRUCTION

Patricia Mulcahy
University of Minnesota

The process of learning and remembering, the puzzle of human memory, the exact nature of the mechanisms that control how we acquire and retain information, are still enigmas to psychologists and educators. The fascination with the way the mind works, though, leads us down several routes to try to solve that puzzle.

Some psychologists have preferred naturalistic observation, an ethnographic approach, to describe what people do when they try to remember, how much they remember, and what they remember. Others prefer a neuropsychological approach to study the neural connections, the brain structures, and the effects of certain drugs on memory processes. Animal psychologists prefer to look at relationships between stimuli and responses in experiments with rats, mice, and dogs to isolate key variables affecting behavior; behaviorists assume that learning processes are not species specific, that many commonalities exist between animals and humans, and that worthwhile generalizations about human learning can be made from their experiments. Some psychologists prefer to study humans who exhibit great memory skill, while others prefer to study humans who exhibit some memory deficit, such as amnesics suffering from Alzheimer's disease or alcoholic Korsakoff syndrome, or who have experienced brain injury or temporal-lobe resection. Still others, in the Ebbinghaus tradition, prefer to study memory through experiments involving humans repeating nonsense syllables or word lists to see the effects of rehearsal, interference, or association.

In sum, the study of human learning and memory has been approached through a variety of perspectives; each perspective has given us intriguing insights about human memory, raised many more interesting questions about human memory processes, and also provided us with several models of memory. This paper is an attempt to highlight dual-store and multiple memory system approaches and to generate specific conclusions of those memory perspectives for educators and students concerned with improving study skills efficiency. This paper focuses primarily on an information processing

perspective in an effort to selectively describe how this perspective about memory can facilitate classroom learning.

Dual-Store Approaches

One of the first dichotomous descriptions of human memory was William James's (1890) distinction between primary and secondary memory. He differentiated between immediate conscious experience and recollections of experience. According to James, primary memory occurs in the present moment as a result of our attention to something; secondary memory involves reviving an object that had been dropped from consciousness.

For many years after James, the study of memory focused on the study of secondary memory rather than primary memory. Then, in the 1950's, the development of computer models of memory influenced the formation of a human information processing model. Broadbent's (1958) dual-store model described the human processor system as two separate memories. Primary, or immediate, memory involves two systems. The "s system," the preattentive sensory store, receives input from the senses, then filters it to a "p system," the site of conscious awareness. With active processing through rehearsal, information is transferred to secondary memory. If the information is not rehearsed in primary memory, it decays quickly and is not transferred. Once the information is moved to the secondary store, though, it is retained for a long time.

One of the major contributions of this model was an emphasis on the role of rehearsal as a key variable in memory processes. One implication of this model is that students who wish to remember information, such as for a test, need to actively rehearse the information. As a result, students need to carefully manage their time so that they can attentively focus on and rehearse what they need to remember.

Another major feature of this model is that it differentiates between the capacities of the two stores. According to this model, primary memory has a limited capacity, whereas long-term storage is unlimited. One way to describe primary memory capacity limitations is through "chunks." Simon (1974) tested memory span for recall of words and phrases and found that, for one-syllable words, a person could remember seven chunks, a result reinforcing Miller's (1956) estimates of "seven, plus or minus two." However, with words of more than one syllable, the chunk size was smaller. In addition, Simon demonstrated only six chunks could be remembered for three syllable words. Simon also showed that words chunked together could be recalled better than words in isolation. For instance, a person could

19

remember three chunks of eight words each for a total of twenty-four words. One conclusion based on Simon's work is that students needing to remember a series of words would benefit from meaningful chunking of items rather than studying items in isolation. A key to chunking is classifying information according to common characteristics and generating a meaningful label for the grouping. Chunking permits the learner to create a semantic network, to see relationships between items, and to recall items in a group. Chunking allows a more efficient storage of items, helping the student to remember more items through their organization.

Levels of Processing

Brown (1958) and Peterson and Peterson (1959), who created what is known as the Brown-Peterson paradigm, demonstrated differences in memory processing. In the experiment subjects were asked to recall a trigram, such as PWQ, after 3, 6, 9, 12, 15, or 18 seconds. Subjects were not allowed to rehearse the trigram and were instructed to count backwards by threes until signaled to recall. Each subject was tested 48 times, 8 times at 6 separate retention intervals. Results of the experiment indicated that subjects forgot the trigram almost completely after 18 seconds. These results show the importance of active processing for recall. If people do not process the information because of intrusions, they very rapidly forget.

The Atkinson and Shiffrin (1968, 1971) structural model of human memory closely resembles Broadbent's information processing model. Like Broadbent, they also distinguish between a short-term store and a long-term store. The major contribution of their model is that it describes control processes that conduct the flow of information between stores. Since these control processes occur primarily in the short-term store, their model refers to this store as the working memory. Their model describes how retrieval from long-term memory depends upon an appropriate retrieval strategy and a successful search of long-term memory. One of these strategies is rehearsal; another is coding. As in Broadbent's model, this model supports the view that rehearsal is necessary for keeping information alive in working memory and for transferring information to the long-term store.

Rehearsal effects have been demonstrated in experiments looking at the serial position of items in a list in free-recall tasks. The Atkinson and Shiffrin model provides a good explanation of the primacy and recency effects of rehearsal in free-recall experiments. The primary effect occurs because items presented first have the most opportunity for rehearsal in the short-term memory store. Items presented last are often recalled since the subject immediately

retrieves those items that have just been put into the short-term memory store (recency effect) in an effort to insure greater recall of the whole list. A student familiar with these rehearsal effects can use the primacy and recency effects in testing situations by writing down hard-to-remember terms as soon as the test is distributed. In addition, by increasing rehearsal of hard-to-remember items, the student can improve the probability of recall.

Cooper and Pantle (1967) developed a hypothesis for the amount of time needed to rehearse information. Their total time hypothesis stipulated that a fixed amount of time was necessary to learn a specific amount of material independent of the number of learning trials. Rehearsal, according to this theory, did not involve developing associations (active rehearsal) but merely repeating items over and over (simple rehearsal). In addition, the total time hypothesis stipulated that effective time was not necessarily the same as nominal (clock) time; daydreaming would not count for active rehearsal. Although this view of rehearsal was challenged by later psychologists, this hypothesis underscores the importance of students needing time to learn. Students learning a new skill need time to develop it to automaticity.

Another type of control process described by the Atkinson and Shiffrin model (1968, 1971) is coding, which refers to the process of representing an external event in memory. Studies by Conrad (1964) indicated that the memory code for a short-term store is an acoustic one. In contrast, the memory code for long-term memory is a semantic one, relying on meaningful associations between items. These findings do not suggest mutually exclusive codes for the two memory stores; however, they do suggest that some meaningful association is necessary between items for long-term memory.

Craik and Lockhart's (1972) levels of processing approach addressed this issue of meaningful association between items for long-term memory. Their model of memory looked at the distinctions of memory processes rather than at memory structures. The levels of processing approach looked at the depth of item analysis. According to this view, rehearsal occurs on two different levels. Type I rehearsal, maintenance rehearsal, basically operates to keep the item alive in the memory store. On the other hand, Type II, elaborative rehearsal, requires more meaningful semantic associations. For instance, saying the letters *L A* over and over again would be a Type I rehearsal, but making a semantic association between L A and Los Angeles would be a Type II rehearsal. Their model assumes that retention is greater with Type II rehearsal.

This levels of processing approach was examined by Craik and Tulving (1975), who presented a depth of processing view of memory.

Their research looked at the complexity of semantic analysis according to levels of structural, phonemic, categorical, and sentence processing. They discovered that memory performance depends not just on the elaboration of items, but also on the qualitative nature of the encoding operations. Retention is improved with a greater depth of semantic involvement. In other words, a student learning a new vocabulary word and its definition has several choices: looking at the structure of the word, sounding out the word, classifying it according to specific criteria, and determining the meaning of the word by placing it in an appropriate context. The depth of processing view predicts better recall after deeper semantic association.

Implications for Students

This research has implications for students interested in improving their recall. For one, studying should not involve mere rote rehearsal. Merely repeating the sound of the words does not insure a deeper processing. Second, students taking notes in lecture classes or from their textbooks would benefit most from paraphrasing the key concepts in their own words rather than re-copying key points. Summarizing key ideas initiates a greater depth of processing. (See Anderson and Armbruster, 1984, for a thorough description of research of levels-of-processing approaches as applied to study skills.) The primary benefit of this theory is that it points to a major fundamental of learning: students need to meaningfully integrate new information with what they know already.

Another major variable affecting retention involves the encoding of items. Research by Tulving and his associates supports the principle of encoding specificity. This hypothesis claims that when the to-be-remembered (TBR) item is stored, a relationship with an appropriate retrieval cue must also be stored with it for effective recall. In recall conditions, when the cue is presented, the TBR item should be remembered. In other words, the type of association between the TBR item and a retrieval cue during acquisition will affect later recall. The use of mnemonics as memory aids is one example of the principle of generating effective cues.

Creating appropriate cues for the TBR items is a special concern of students. An experiment by Tulving and Osler (1968) examined the interaction between study and test conditions. They found that the best recall of items occured when there was a match between cue words on a test and cue words presented during study. This finding has major implications for those who wish to improve their test-taking performance. One implication is that students need to create appropriate retrieval cues for TBR items; students need to match cues

from the course with test items and to generate the cues they anticipate will be on the test. This implies that students need to be familiar with the type of academic discourse used in the course and the specific content vocabulary of the course to be able to make associations between concepts discussed in class and in the text for recall of those concepts on a test. One implication of the encoding specificity principle is that students should attend to the associative cues the course instructor delivers during course lectures. Another implication of this principle is that the closer the match between study conditions and test conditions, the higher the probability of recall. Simulating testing conditions may improve actual test performance.

The significance of the association between the retrieval cue and the TBR item during encoding procedures was supported in an experiment demonstrating the phenomenon of recognition failure of recallable words (Tulving and Thomson, 1973; Watkins and Tulving, 1975). In this experiment subjects were asked to recall words initially learned in association with a cue. The experiment showed that subjects could recall these words even though they failed to recognize them when the recognition test lacked appropriate retrievel cues. Their experiment showed that when these cues were reinstated, recall occurred. This phenomenon often occurs when people fail to recognize someone out of context, yet can immediately recognize the individual in familiar context. This research indicates the importance of creating appropriate retrieval cues during study.

The importance of the learning context was researched by Baddeley (1975, 1981), who looked at domains of recollection. His studies supported the notion that the learning context influences the recall of items. In an experiment with deep-sea divers, he showed that when the learning context was the same (land versus underwater) as the testing condition, recall was higher than when the learning context was different from the testing condition. This research has major implications for educators who give tests in environments different from the learning environment. Other factors unforeseen by the instructor could threaten the test validity.

Another factor influencing the coding of items is the difference between picture and word cues. Paivio's (1976) dual-code theory distinguishes between two different memory systems for image codes and for verbal codes; processing for these codes may very well occur in different brain hemispheres (Bower, 1970). This theory accounts for the superiority of picture recognition over word recognition. Dual coding is highest for pictures since the picture can be represented with both an image and a word memory. Dual coding is lowest for abstract words. This research supports using imagery to encode and

recall items. Students wishing to improve their memory performance can use imagery and mnemonics as effective retrieval cues.

Descriptions of memory as a multi-store model has generally differentiated between two types of memory stores: a short-term, working memory store and a more permanent, long-term store. One recent examination of memory performance has discovered a new memory state, described by Bahrick (1984) as a permastore. In a study of long-term storage, he looked at the retention of Spanish fifty years after studying the language. He found that a major variable influencing retention of Spanish was the original level of training. Even without rehearsal, subjects could remember items fifty years after studying Spanish; better performance occurred with higher original levels of training. His long-term study demonstrated that memory loss for Spanish occurred during the first five years after original learning, then remained relatively stable for five to twenty-five years. Even though Bahrick's conception has been sharply criticized (Neisser, 1984), his long-term study supports the importance of original learning as a major variable for students' long-term memory performance.

Multiple Memory Systems

Representing memory systems as interdependent, organized structures has led psychologists such as Tulving (1985) to conceptualize memory in different terms than those of the dual-store models. Tulving's monohierachical classification scheme involves three different memory systems and three different kinds of consciousness. Each type of memory system implies a specific type of consciousness. Each memory system is related to the other.

Tulving describes the first memory system as procedural, which "enables organisms to retain learned connections between stimuli and responses, including those involving complex stimulus patterns and response chains, and to respond adaptively to the environment"(p. 387). Procedural memory utilizes perceptual, cognitive, and motor skills. For instance, tying your shoes involves procedural memory. Anoetic (nonknowing) consciousness is associated with procedural memory. It "refers to an organism's capability to sense and to react to external and internal stimulation, including complex stimulus patterns. Plants and very simple animals possess anoetic consciousness as do computers and learning machines that have knowledge and that can improve it" (p. 388).

The second memory system, semantic memory, refers to representations of mental models of states of the world. These representations describe the world. Noetic (knowing) consciousness is associated with

semantic memory. This type of consciousness "makes possible introspective awareness of the internal and external world. We can say the object of noetic consciousness is the organism's knowledge of its world" (p. 388). Tulving supports Kintsch's (1972) model of semantic memory as a language processing structure.

The third system is episodic memory. As a record of a person's past, episodic memory refers to temporally dated events in a person's distinct autobiography. Episodic memory possesses autonoetic consciousness, allowing the person "to become aware of his or her own identity and existence in subjective time that extends from the past through the present to the future... It can be impaired or lost without impairment or loss of other forms of consciousness" (p. 388) as in the case of persons suffering from amnesia.

The contributions of this perspective of memory to study skills have generally not been explored. However, as new research about the connections between episodic memory and metacognition is explored, the value of personal awareness of one's own study strategies will be clearer. This research raises some interesting questions about the role of the different memory systems and kinds of consciousness in study efficiency and academic performance.

Summary

Research describing different memory systems highlights the effectiveness of several different types of study strategies. For one, information, if it is to be remembered, needs to be rehearsed. Greater amounts of rehearsal will increase the activation of information in the short-term store and the likelihood of its transfer to long-term memory. However, retrieval of information from the long-term store is highly dependent on the level and depth of processing of the information, the association between the retrieval cue and the TBR items, and the similarity between the learning context and the testing situation. Chunking items and forming image cues will also facilitate recall.

New directions for examining study skills include looking at memory as a multiple interdependent system. The effect of autonoetic consciousness on metacognitive awareness needs to be explored, as well as the importance of episodic memory on study improvement. Even though the puzzle of memory is still unsolved, research about these memory systems has contributed to our consciousness about effective study strategies.

REFERENCES

Anderson, T., & Armbruster, B. (1984). Studying. In P.D. Pearson, et. al. (Eds.), *Handbook of reading research* (pp. 657-679). New York: Longman.

Atkinson, R.C., & Shiffrin, R.M. (1968). Human memory: A proposed system and its control processes. In K.W. Spence & J.T. Spence (Eds.), *The psychology of learning and motivation: Vol. 2.* New York: Academic Press.

Atkinson, R.C., & Shiffren, R.M. (1971). The control of short-term memory. *Scientific American, 225,* 82-90.

Baddely, A.D. (1981). The cognitive psychology of everyday life. *British Journal of Psychology, 72,* 257-269.

Baddeley, A.D. (1982). Domains of recollection. *Psychological Review, 89,* 708-729.

Baddeley, A.D., Cuccaro, W.J., Egstrom, B., Weltman, G., & Willis, M.A. (1975). Cognitive efficiency of divers working in cold water. *Human Factors, 17,* 446-454.

Bahrick, H. (1984). Semantic memory content in permastore: Fifty years of memory for Spanish learned in school. *Journal of Experimental Psychology: General, 113,* 1-29.

Bower, G.H. (1970). Analysis of a mnemonic device. *American Scientist, 58,* 496-510.

Broadbent, D.E. (1958). *Perception and communication.* New York: Academic Press.

Brown, J. (1958). Some tests of the decay theory of immediate memory. *Quarterly Journal of Experimental Psychology, 10,* 12-21.

Cooper, E.H., & Pantle, A.J. (1967). The total-time hypothesis in verbal learning. *Psychological Bulletin, 68,* 221-234.

Conrad, R. (1964). Acoustic confusions in immediate memory. *British Journal of Psychology, 55.* 75-84.

Craik, F.I.M., & Lockhart, R.S. (1972). Levels of processing: A framework for memory research. *Journal of Verbal Learning and Verbal Behavior, 11.* 671-684.

Craik, F.I.M., & Tulving, E. (1975). Depth of processing and the retention of words in episodic memory. *Journal of Experimental Psychology: General, 104,* 268-294.

James, W. (1890). *Principles of psychology.* (Vol. 1). New York: Henry Holt.

Kintsch, W. (1972). Notes on the structure of semantic memory. In E. Tulving, & W. Donaldson (Eds.), *Organization of memory.* New York: Academic Press.

Miller, G.A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63,* 81-97.

Neisser, U. (1984). Interpreting Harry Bahrick's discovery: What confers immunity against forgetting. *Journal of Experimental Psychology: General, 113,* 32-35.

Paivio, A. (1976). Imagery in recall and recognition. In J. Brown (Ed.), *Recall and recognition.* New York: Wiley.

Peterson, L.R., & Peterson, M.J. (1959). Short-term retention of individual verbal items. *Journal of Experimental Psychology, 58,* 193-198.

Simon, H.A. (1974). How big is a chunk? *Science, 183,* 482-488.

Tulving, E. How many memory systems are there? *American Psychologist, 40,* 385-398.

Tulving, E., & Osler, S. (1968). Effectiveness of retrieval cues in memory for words. *Journal of Experimental Psychology, 77,* 793-601.

Tulving, E., & Thomson, D.M. (1973). Encoding specificity and retrieval processes in episodic memory. *Psychological Review, 80,* 352-373.

Watkins, M.J., & Tulving, E. (1975). Episodic memory: When recognition fails. *Journal of Experimental Psychology: General, 104,* 5-29.

Zechmeister, E., & Nyberg, S. (1982). *Human memory.* Monterey: Brooks/Cole.

GENERAL VS. ADJUNCT READING/STUDY SKILLS INSTRUCTION FOR A COLLEGE HISTORY COURSE

Mary K. Elliott
Marilyn Fairbanks
West Virginia University

Reading/study skills instruction within a college course or laboratory setting has traditionally been thought generally applicable to a variety of courses. Such instruction is based on the premise that students will then transfer these general skills to tasks in their own academic courses. Evaluative reviews of college reading program reports (Fairbanks, 1974; Sanders, 1979) indicate that some programs have been successful in positively affecting academic achievement while others have not.

Several attempts have been made to isolate factors which have served as contributors to academic achievement in reading/study intervention programs. The analytical reviews of both Fairbanks (1974) and Sanders (1979), for example, indicated that the inclusion of a variety of both reading and study skills offerings in a skills intervention program for college students was a factor associated with favorable grade point average comparisons for participating over nonparticipating student groups. Cross (1976), from her own analysis of the college reading/study skills literature, isolated five factors which she felt closely enough associated with academic improvement to offer as recommendations for future programs; (1) that "transfer of training does not take place automatically" and that skills training should be integrated into the "other experiences of the student"; (2) that social and emotional development be integrated with attempts to enhance the student's cognitive development; (3) that staff working with remedial students be chosen for their "interest and commitment as well as for their knowledge of learning problems"; (4) that college credit be given for remedial instruction; and (5) that skills instruction be offered in a way that would enhance, rather than inhibit, the development of a positive self-concept.

A programmatic response to the first concern expressed by Cross, that of transfer of learned skills to use in academic subjects, has been the advent of adjunct or paired reading/study skills courses. The extent of interest and involvement in this type of supplementary skills instruction offered outside of, but in conjunction with, a specific

academic course was indicated in a national survey by Mayfield (1978), which reported the existence of such skills intervention programs in thirty colleges or universites.

Adjunct classes have generally proven successful. Tomlinson and Tomlinson (1975) reported positive results of an adjunct seminar designed by a biology major and a reading specialist for an introductory biology class. Students who had attended at least 50% of the adjunct seminars had significantly higher mid-term exam scores than students who had not participated. Wilson (1978) reported similar positive results for students attending ten of a possible thirteen adjunct sessions taught in conjunction with a university history course. Enright (1979) reported a systematic, self-paced learning center program for students in four areas where help was often requested: mathematics, chemistry, psychology, and economics. While the program was positively appraised in terms of student and faculty response and attitudes, retention or grade improvement results were not considered conclusive because of the late start of the program during the academic year. Ganschow (1980) reported positive results for paired courses in several content areas in which content instructors, adjunct reading/study skills instructors, and peer tutors had incorporated their efforts in the planning and expedition of adjunct course instruction. Harding (1981) reported on a program which, within a five-year period, had expanded from one adjunct course each in psychology and sociology to ten adjunct courses in seven departments. While student response and progress seemed to be regarded positively, problems were noted resulting from two factors: students were not given academic credit for the adjunct sessions, and instructors were voluntarily teaching sessions in addition to their regular course loads. GPA and retention studies were reported as incomplete.

At West Virginia University Reading Laboratory (URL) voluntary courses were introduced as an added alternative to the general reading/study skills offerings which had been available (Fairbanks & Elliott, 1983). Both of the current authors have been involved with both types of programs at this institution. While student response to both types of programs had been generally positive, transfer of skills to academic courses was a concern, and several professors had expressed interest in the adjunct seminars. Therefore, a formal evaluation of the two modes of skills instruction seemed warranted. This study (Elliott, 1982) was designed to evaluate the relative influence on history course exam grades of a general reading/study skills program designed for use in all academic areas and of an adjunct seminar designed specifically for the undergraduate history course involved. A secondary objective was to compare the effects of reading/study skills instruction, whether general or adjunct, on history course per-

formance, using a group of students from the same classes not electing the reading/study skills instruction as a quasi-control group for comparison purposes.

Methods

Students in the history course were given their choice of two course projects: participation in reading/study skills seminars or completion of a term paper. Those choosing the seminars were randomly assigned to either the general or the adjunct/academic skills seminars. Those choosing the term paper received no skills instruction and were considered to be a quasi-control group. Numbers of students comprising the final comparison groups were as follows: adjunct skills group, 14; general skills group, 16; and the term-paper, quasi-control group, 24.

Both general and adjunct reading/study seminars were designed to include factors associated with positive effects on academic success. The two instructors, each of whom conducted both general and adjunct academic skills seminars, were experienced in college skills training and informal counseling, and were known for their interest in and commitment to college students seeking help in reading and study skills. Instruction for both groups included a variety of reading and study skills. Although separate academic credit was not offered for the skills instruction seminars, their inclusion as a graded part of the history course provided immediate incentive.

The skills included in both adjunct and general groups were lecture and text note-taking, preparing for and taking exams, developing technical vocabulary, and increasing reading efficiency. In addition, the general group devoted time to study habits while the adjunct group devoted extended time to integrating lecture and text notes, using these notes to predict test questions and to formulate answers to the questions posed. These adjunct seminar activities emerged from an analysis of type of course tests, organization of text, and instructor style. The Flow Chart in Figure 1 summarizes the integration strategies used in the adjunct group.

While the emphasis in the general group was on transfer of skills to all academic areas, the emphasis in the adjunct group was on direct application of skills to preparation for exams in the history course in which students were enrolled. Strategies, materials, and methods were adjusted to group purposes. For text note-taking, for example, the Wark underlining method (1970), a method preferred by URL students, was used for the general group; however, for the adjunct group, outlining was used so that notes from both lecture and text could be coordinated. In instances where both groups used the same

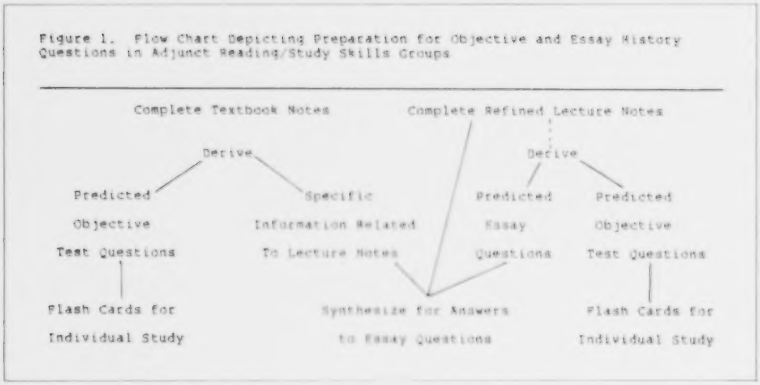


Figure 1. Flow Chart Depicting Preparation for Objective and Essay History Questions in Adjunct Reading/Study Skills Groups
Complete Textbook Notes
Complete Refined Lecture Notes
Derive
Derive
Predicted Objective Test Questions
Specific Information Related To Lecture Notes
Predicted Essay Questions
Predicted Objective Test Questions
Flash Cards for Individual Study
Synthesize for Answers to Essay Questions
Flash Cards for Individual Study

Figure 1. Flow Chart depicting preparation of objective and essay History questions in adjunct Reading/Study groups.

method, such as the Cornell method for lecture note-taking (Pauk, 1975), the general group used a variety of materials from various academic areas while the adjunct group used material specifically oriented to the history course content and the type of test items announced by the history course professor.

Time and Evaluation Factors

Six 50-minute sessions were provided for both general and adjunct groups. Six 25-minute follow-up sessions were arranged for students whose initial session assignment did not meet the established minimum assignment criteria. These time limitations were necessitated by course constraints and the need to balance skills and term paper group requirements. The total instructional time devoted was within the time range for successful programs reported by Sanders (1979).

The time frame for offering instruction within the history course was influenced by both course and research factors. The four history exams were designed, administered, and graded by the history professor. No treatment was provided until after the first exam so that the history professor could establish initial rapport with the students and so that pre-treatment comparisons could be made across groups. The reading and study skills instruction was completed just before the third exam, which served then as an immediate post-test evaluation of the skills instruction. The fourth test was the final examination, which covered information from the entire semester, including

material presented before skills instruction began. The cumulative exam score from the three course tests administered after skills instruction began (history tests two, three, and four) was considered a better indicator of possible skills intervention effect on course exam grades than was the cumulative final exam and was, therefore, used for the second comparison measure.

Results

To determine if the three groups were similar in performance prior to the initiation of the reading-study skills treatment, a one-way analysis of variance was computed using the mean total score from the first exam for each group (adjunct, 67.14; general, 56.75; quasi-control, 67.42). While this analysis did not yield a significant difference, it did approach significance (p. .09). Therefore, analysis of covariance was used in evaluating the relative effectiveness of the three groups.

Table 1 shows the raw and adjusted means for history test three, which served as the immediate post-text for the skills instruction, and the cumulative history scores from the exams (tests two, three, and four) administered after skills instruction began. For the immediate post-test, the adjunct group had the highest adjusted mean score, followed by the general study skills group, with the quasi-control group in third position. Analysis of covariance computed on these adjusted means for exam three, using exam one as the covariate, indicated that no significant differences existed.

Table 1
Group Means for Post and Cumulative Test Scores

	Adjunct		General		Quasi-Control	
	Raw	Adjusted	Raw	Adjusted	Raw	Adjusted
History Exam 3 (Immediate Post Treatment)	79.93	76.50	68.50	73.71	73.25	70.97
Partial Cumulative Scores (Exams 2-4)	216.79	209.78	108.88	187.06	194.71	198.06

When cumulative exam scores from history tests two, three, and four were compared, the adjunct group again had the highest mean, followed this time by the quasi-control group, with the general skills group in third position. Analysis of co-variance, followed by the Duncan Multiple Range test, indicated a significant difference favoring the adjunct over the general reading/study skills group.

Discussion

The primary objective of this study was to compare the relative effectiveness of two types of reading/study skills instruction, general and course specific, on test performance in a college history course. When the two randomly assigned treatment groups were compared, the adjunct skills instruction was found to be more successful in terms of overall history course performance than was the more generally-focused skills intervention.

A secondary objective of the study was to compare the effectiveness of skills instruction, regardless of group, with a no-skills instruction condition. When the quasi-control group for which assignment by student-selection rather than by randomization was included in the comparison, no clear-cut advantage for either skills group over the term paper group could be claimed. While this no-instruction condition by selection was considered necessary by the course instructor in order to give students a course project choice, it apparently resulted in differences in group composition. In the experimental groups, 87% of the students were either freshmen or sophomores; in the quasi-control group, however, only 58% of the students were underclassmen. Also, it was noted that a number of individuals in the quasi-control group were "older" freshmen or sophomores (22 or older) while all of the students in the experimental groups were in the more typical range of 18-20. These factors suggest that a number of individuals who chose the term paper project may have done so because they felt that they already had sufficient competency in reading and study techniques.

While these findings lend some support for the establishment of adjunct reading/study skills groups for specific academic courses, further studies using randomized assignment for all groups would be needed to ascertain whether a clear-cut advantage over a no-instruction condition existed. Also, a number of other factors need consideration. The adjunct seminars required more time and staff. The senior author attended all of the history course lectures, took lecture notes, and evaluated both the lecturer's style and the textbooks. In designing the materials and strategies which were to be used in the adjunct skill sessions, she also considered textbook organization, teacher style, and the types of history exam questions to be used in the course.

From an economic viewpoint, adjunct instruction probably could not be supplied for all courses in a college or university. Perhaps energies should be concentrated on freshmen courses known to be particularly difficult for students or on those courses where the most benefits would seem to accrue. Findings of this study, as well as that

of Granschow (1980), suggest that students in social studies courses, for example, may particularly profit from this type of instruction.

Considering the relatively strong course performance of the quasi-control group, it would also seem advisable that participation in an adjunct seminar should be voluntary or by criterion-based selection, supported by evidence of need for supplementary skills instruction. Since learning and achievement in college content courses are basic education goals, further comparisons of adjunct and general reading/study skills intervention definitely seem warranted.

REFERENCES

Cross, K. P. (1976). *Accent on learning: Improving instruction & reshaping the curriculum.* San Francisco: Jossey-Bass Higher Education Series.

Elliott, M. K. (1982) *The relative effectiveness of general versus specific reading/study skills treatments on achievement in a history survey course.* Unpublished doctoral dissertation, West Virginia University, Morgantown.

Enright, G. (1979). A systematic program for the transfer of learning skills to the content areas. In G. Enright (Ed.) *Proceedings of the Twelfth Annual Conference of the Western College Reading Association, 12,* 87-95.

Fairbanks, M. M. (1974). The effect of college reading improvement programs on academic achievement. *Interaction: Research and Practice for College-adult Reading:* Twenty-Third Yearbook of the National Reading Conference. Clemson, South Carolina: National Reading Conference.

Fairbanks, M. M., & Elliott, M. K. (1983). Content area adjunct seminars as a mode of reading study skills instruction. *Forum for Reading, The Journal of College Reading Improvement, 13,* 34-37.

Granschow, L. (1980). Integrating basic reading, writing, and study skills in the content area. *Journal of Developmental and Remedial Education, 3* (3), 24-26.

Harding, I. B. (1981). Adjunct courses: Integrating study skills into content courses, In G. Enright (Ed.), *Proceedings of the Fourteenth Annual Conference of the Western College Reading Association, 14,* 110-116.

Mayfield, C. K. (1978). A survey of reading programs and materials in content areas in higher education. In G. Enright (Ed.), *Learning Assistance: Charting our Course. Proceedings of the Eleventh Annual Conference of the Western College Reading Association, 11,* 35-37.

Pauk, W. (1975). *How to Study in College* (2nd Ed.). Boston: Houghton-Mifflin.

Sanders, V. H. (1979). *A meta-analysis: The relationship of program content and operation factors to measured effectiveness of college reading-study programs.* Unpublished doctoral dissertation, University of the Pacific (University Microfilms 23,975).

Tomlinson, B., & Tomlinson, M. (1975). Integrating reading and study skills into college biology. (ERIC Document Reproduction Service No. ED 125 903).

Wark, D. M., & Mogen, M. (1970). *Read, underline, review: A method for more efficient learning.* New York: McGraw Hill.

Wilson, M. (1978). A report on an adjunct course designed to integrate reading and study skills with a university academic class. (ERIC Document Reproduction Service No. ED 159 611).

CREATING A HIERARCHY OF VERBAL ANALOGY RELATIONSHIPS: A BEGINNING

Jane N. Hopper
California State University, Fullerton

Verbal ability is considered to be one of the best predictors of success in the academic situation, and verbal analogy tests are held to be among the best tests of that ability. Spearman (1923) proclaimed that the ability to think analogically is an important component of intelligence when he described how three of his "principles of cognition" were based upon processes used in solving analogies. Experience and controlled studies over the years have done nothing to diminish this belief (Pellegrino, 1985). In the past few years, in an attempt to more fully understand the nature of intellectual processing, numerous studies have investigated the activities undertaken by subjects as they solve verbal analogies (Alderton, Goldman & Pellegrino, 1985; Bisanz, Bisanz & LeFevre, 1984; Whitely, 1977a; Whitely & Barnes, 1979; Whitely & Dawis, 1974). While these studies are of interest to students of learning, they do not yet provide us with enough information to guide our attempts to improve student performance.

As teachers we are concerned with helping students gain access to whatever instruction is necessary to attain their academic goals. One way to assist is to help them succeed on those screening devices that employ verbal analogies. It is known that students can improve scores on verbal analogy tests after they receive instruction on and about verbal analogies (Whitely & Dawis, 1974; Hopper, 1985). What this indicates about the nature of intelligence, or about the validity of theories that view performance on verbal tests as predictors of academic success is not the concern of this paper. Here the interest is strictly pragmatic: How can students improve performance on verbal analogy tests to the greatest effect in the least time? That is, if intervention helps, of what should that intervention consist? The answers to these questions may begin with identifying various levels of difficulty in verbal analogies so that instructors will know where to begin intervention and where to place the most emphasis.

The difficulty level of verbal analogy tests can be varied in a number of ways beyond the obvious one of changing the difficulty of the vocabulary used. Variations may include using concrete or abstract terms or relationships, adjusting the nuances of meaning

in the supplied alternatives, and altering the types of relationships used. Research seems to give conflicting information about which relationships are easier, which more difficult to process (Sternberg & Nigro, 1980; Klix & Van der Meer, 1978; Whitely & Dawis, 1974). One problem is that the terms are not standardized. While it is probably safe to assume that "opposite," "contrast," and "antonym" are the same, we cannot be sure what terms such as "compare" and "quality" mean.

This study focuses on types of relationships for the purpose of determining which relationships are more difficult than others. Twelve relationships have been selected for investigation. They are lesser-greater degree, singular-plural, adjective-noun word forms, characteristic, relative position, part-whole, natural medium, antonym, synonym, function, general-specific and cause-effect. This is not intended to be an inclusive list, but it does represent many of the standard analogy relationships used in tests reviewed. If the relative difficulty of the various relationships can be determined, instructors should be able to begin training with the easier relationships and provide extra practice on the more difficult ones. With limited time available, instructors need to give verbal analogy instruction to students as efficiently as possible.

Method

Subjects.

Subjects participating were 60 students of READ 201 and READ 202 at California State University, Fullerton, freshman through senior level, approximately half males, half females. Some students did not have English as their first language.

Materials.

Verbal analogy training material consisted of one sheet listing some possible relationships with examples. A second sheet contained blanks to be filled in to create verbal analogies. The analogies varied from simple to more complex and from one word needed for completion to three words needed for completion. Words were supplied for each column that had been left blank so that students were guided to correct answers. The tests themselves consisted of three sets of verbal analogy work sheets, of increasing vocabulary difficulty. Each sheet contained twelve verbal analogies representing the twelve selected relationships. The twelve items in each set were scrambled on the pages to offset the tendency to work from top to bottom on the sheets.

Procedure.

In the first session, subjects were given a brief introduction to analogies in general and then to verbal analogies in particular. Various relationships from the training handout were discussed. Subjects then completed the second sheet, the training work sheet, and were given feed-back.

In the second session, work sheets (the tests) of set one were distributed in random order with instructions to complete the verbal analogies beginning with the easiest and working toward the hardest, indicating the order of processing in the left margin. As subjects finished a set, they were given the next set until three sets were completed.

Despite instructions to look over all the verbal analogies, beginning with the easiest and proceeding toward the most difficult, a few subjects began with the first item on the page and worked sequentially. Although the items were rotated on the sheets to keep this proclivity on the part of subjects from skewing the results, it was determined that any sheet on which the sequence of processing proceeded exactly from one to twelve should be discarded. It is highly unlikely that the items would occur on the page in order of difficulty, so that a one-twelve method of processing indicated a failure to follow instructions. All other data sheets were tabulated, each set separately, and a summary sheet prepared. Tabulations were then grouped into quartiles to more clearly display response patterns. Responses were further divided at the center line; that is, any response of six or below was considered "easy" and any response of seven or above to be "hard." The number of errors for each type of analogy was tabulated and recorded.

The total number of tabulations possible for each type of analogy, the sum of sets one, two, and three, is 165. With this small number, quartile grouping does not provide clear results. Patterns begin to emerge more clearly when we add together the two lower quartiles, which represent "easier" designations, and the two upper quartiles, which represent "harder" designations, dividing the data at the center line. These totals for upper and lower halves are displayed, for each type of relationship, in brackets, on difficulty level 4 of "easier" judgments and on difficulty level 10 of "harder" judgments in Table 1. The total number of errors for each relationship is recorded below the table.

Table 1
Summary Sheet of Sets 1, 2 and 3

Type of Analogy

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2	(52)	(53)	(22)	(25)	(53)	(49)	(75)	(21)	(11)	(40)	(65)	(25)
3												
4	[113]	[96]	[52]	[57]	[106]	[96]	[115]	[39]	[22]	[92]	[122]	[78]
5	(61)	(43)	(30)	(32)	(53)	(47)	(40)	(18)	(11)	(52)	(57)	(53)
6												
7												
8	(38)	(41)	(54)	(65)	(34)	(40)	(35)	(33)	(34)	(49)	(31)	(48)
9												
10	[52]	[69]	[113]	[108]	[59]	[69]	[50]	[126]	[143]	[73]	[43]	[87]
11	(14)	(28)	(59)	(43)	(25)	(29)	(15)	(93)	(109)	(24)	(12)	(39)
12												

Total Errors Per Type of Analogy

A	B	C	D	E	F	G	H	I	J	K	L
52	53	88	46	21	45	11	61	85	28	3	48

Legend

A - Lesser-greater
B - Singular-plural
C - Adjective-noun
D - Characteristic
E - Relative position
F - Part-whole
G - Natural medium
H - Antonym
I - Synonym
J - Function
K - General-specific
L - Cause-effect

(Tabulation) - Quartile Estimates
[Tabulation] - Total Estimates 1-6
Total Estimates 7-12
Tabulation - Errors

Harder - Estimated Order Of Difficulty - **Easier**
(strip in on right hand side, vertically, next to numbers)

Results

Using a total of 100 judgments out of the possible 165 as the cut-off point, the researcher was able to reach the following conclusions:

A. The relationships perceived to be easiest were lesser-greater degree, relative position, natural medium, and general-specific.

B. The relationships perceived to be most difficult were adjective-noun word forms, synonym, antonym, and characteristic.

C. Relationships for which no determination could be made were singular-plural, part-whole, function, and cause-effect.

The relationship of the errors to the estimated level of difficulty is not clear, but our surmise is that, while subjects might perceive a verbal analogy to be "difficult" and still get it right, they should not perceive it to be "easy" and then get it wrong. Therefore, if a relationship has numerous tabulations at the top of the table (that is, ranked first, second, or third in level of difficulty) and shows few errors, the perception of "easy" is validated. It may be significant to note that, in sets two and three, where most errors occurred, about half the students marked incorrect answers for those relationships they judged to be most difficult (either 11 or 12) on the difficulty scale. Subjects noted that these items were difficult, and they indeed were. Of the "easier" relationships, the lesser-greater category showed 62 errors; relative position showed 21 errors; natural medium showed 11 errors, and general-specific showed 3 errors. We can conclude from this that, at least in this case, natural medium and general-specific are indeed easier relationships. Of the "harder" relationships, adjective-noun word forms produced 88 errors; synonym produced 85 errors; antonym produced 61 errors, and characteristic produced 46 errors. This researcher concludes from this evidence that adjective-noun word forms and synonyms are more difficult than other relationships used in this initial investigation. Although one study (Sternberg & Nigro, 1980, p.27) reported that antonym relationships were easier than synonym relationships "at all levels," our results show that, while antonyms seem to be somewhat easier than synonyms, both relationships were judged to be more difficult than ten other presented relationships.

As the study continues and more subjects contribute their estimates of difficulty to the already collected data, the author hopes to verify the above conclusions, to refine them, and to establish a hierarchy of difficulty. While this hierarchy includes only twelve of the many possible relationships, it might be combined with similar studies to produce a final, more complete hierarchy. Investigations like those undertaken by Whitely (1977b) might discover relationships

between success on specific verbal analogy types and the ability to perform other learning tasks. The author would like to see, in the near future, an extensive or, if possible, inclusive list of verbal analogy relationships labeled with standardized terms so that researchers can use a common vocabulary as they work toward a common goal: that of understanding how the human mind processes verbal analogies.

REFERENCES

Alterton, D.L., Goldman, S.R., & Pellegrino, J.W. (1985). Individual differences in process-outcomes for verbal analogy and classification solution. *Intelligence, 9*(1), 69-85.

Bisanz, J., Bisanz, G.L., & LeFevre, J.A. (1984). Interpretation of instructions: A source of individual differences in analogical reasoning. *Intelligence, 8*(2), 161-177.

Hopper, J.N. (1985). *Improving verbal analogy performance.* Unpublished manuscript.

Klix, F., & Van der Meer, E. (1978). Analogical reasoning: An approach to cognitive microprocesses as well as to intelligence performance. *Zeitschrift fur Psychologie, 186*(1), 39-47.

Pellegrino, J.W. (1985). Anatomy of analogy. *Psychology Today, 19*(10), 50-54.

Spearman, C. (1923). *The nature of intelligence and the principles of cognition.* London: Macmillan.

Sternberg, R.J., & Nigro, G. (1980). Developmental patterns in the solution of verbal analogies. *Child Development, 51*(1), 27-38.

Whitley, S.E. (1977a). Information-processing on intelligence test items: Some response components. *Applied Psychological Measurement, 1*(4), 465-476.

Whitley, S.E. (1977b). Relationships in analogy items: A semantic component of a psychometric task. *Educational and Psychological Measurement, 37*(3), 725-739.

Whitely, S.E. (1976). Solving verbal analogies: Some cognitive components of intelligence test items. *Journal of Educational Psychology, 68*(2), 234-242.

Whitely, S.E., & Barnes, G.M. (1979). The implications of processing event sequences for theories of analogical reasoning. *Memory & Cognition, 7*(4), 323-331.

Whitley, S.E., & Dawis, R.V. (1974). Effects of cognitive intervention on latent ability measured from analogy items. *Journal of Educational Psychology, 66*(5), 710-717.

IDENTIFYING NATIVE AMERICAN LEARNING STYLES

Joan Wauters
University of Alaska, Fairbanks
Marci Matlock
Navajo Community College
V. Con Osborne
Brigham Young University

Are there specific strategies which can help minority students succeed in college? Developmental educators are so concerned with helping high risk students survive in the maze of academia that they may unwittingly accept a "deficit" view of their students and their abilities. They concentrate on remediating student scholastic weaknesses and in the process overlook their unique backgrounds and talents. Learning style research offers a more positive pedagogical model, for it emphasizes student differences in a non-pejorative way. By discovering how to identify students' learning styles, instructors can begin to plan curricula which take advantage of students' cognitive strengths.

In the recent past, researchers throughout the world have attempted to determine how individual students acquire and retain given bits of information. Educators, psychologists, anthropologists, neurologists, and others have joined the quest in an attempt to demonstrate that today's children do learn in different ways. The major thrusts of the reported research are to diagnose individual learning characteristics, to encourage bicognitive ability, to create individual awareness of personal learning styles, to design instructional experiencs to enhance individual strengths, and to match instructional materials and methods to meet individual preferences. The results continue to add to our knowledge of individual differences and the consequent adaptations and adjustments that can be made to improve the overall educational setting. Barbara Shade (1984) sums up the overall objectives of learning style research when she says, "... if we are going to increase the acquisition of the content with which these students need to function in the general society, then changes in the teaching method are needed to accommodate the perceptual orientation of the students and increase the salience of the message schools wish to decode." (p. 634).

Various kinds of instruments have been devised in the attempt to learn more about learning. Most of the instruments designed to gather the information necessary to accomplish these objectives are self-report inventories. Many of them depend on rank ordering of items. Administration time may be as short as five minutes or as long as several hours.

Although the terminology of various researchers may indicate that they are reporting on different characteristics, actually their terms and their models often overlap. Canfield (1976) assesses academic conditions, structural conditions, achievement conditions, content, mode of preferred learning, and expectation of performance level. Dunn, Dunn and Price (1975) note the importance of environmental, emotional, sociological, and physical preferences. Hill (1976) focuses on the unique ways that symbols are handled, the cultural influences, and the meanings taken from symbols. Kolb (1981) feels that learners can be classified in one of four learning styles related to basic personality types.

Underlying the assumption of differences in learning styles is the belief that learning style derives from various factors, differing from individual to individual. Among the factors often mentioned are academic and environmental conditions, mode of preferred learning, handling of symbols, cultural influences, heredity, field independence, child raising, hemispheric dominance, and visual perception. The researchers involved do not readily agree on which factors dominate, although many are willing to admit that factor influences can and do change. For example, the Dunns (1978) indicate no relationship between children's learning styles and those of their parents or siblings while Kolb (1981) suggests that learning style is inherited.

Many researchers have been intrigued by the possibility that cultural differences affect the ways that things are perceived and information processed. If this assumption is correct, then those students taught without regard for their learning differences may be in grave danger of failing in our educational system. Back in the early 1970's, Kleinfeld (1970) pinpointed the mismatch between learning style and instructional methods as a prime cause of school failure.

Brent Kaulback (1984) notes the reliance of Native American children to learn by observing and imitating the actions of their parents, elders, and siblings. Tied closely to this, as he indicates, are distinctive child-raising practices, observational with Native Americans as opposed to the learning through verbalization techniques of American Whites. Ross (1982) singles out brain dominance as a major difference of Native Americans, who he declares are likely to be dominant in right hemispheric thinking. In fact, he feels that

traditional Native American education is a right hemispheric function which is creative, non-linear, holistic, imaginative, and intuitive.

The implications of such research for minority education programs are enormous. As Gardner (1980) has hypothesized, " in spite of the dangers inherent in generalizing about all children of a specific culture, there are customary methods of child rearing in each cultural group which strongly influence cognitive learning styles for children of that group." (p. 1). While not ignoring the potential problem of pigeonholing students by ethnic group, we cannot ignore cultural differences in learning styles if we wish to make developmental programs relevant to our student population.

To further explore the relation of ethnicity and learning style, the researchers conducted a cross-cultural study of students at three different colleges. Results of learning style inventories were compared for three groups of freshmen: Navajos, Alaska Natives, and Alaska Caucasians. This study was a follow-up to previous research conducted by one of the authors, which revealed some significant differences between Alaska Native and non-Native high school seniors (Wauters, Merrill, & Black, 1984). This finding made the author question whether the learning style pattern shown by Alaska Natives would also be found among other Native American groups. Thus, the major purpose of this present study was to discover if Navajo students had more learning style similarities to the Alaska Native group than the Caucasian group.

Method

Subjects

The researchers tested students from three colleges: Navajo Community College (NCC) in Tsaile, Arizona; Sheldon Jackson College (SJ) in Sitka, Alaska; and the University of Alaska-Juneau (UAJ). One-hundred and sixty-five students were tested, but only results of Alaska Native, Caucasian, and Navajos were used for this study. These groups accounted for a total of 155, all but 10 of the students tested. Of the 155, all 68 NCC students were Navajo. The SJ students were predominantly Alaska Native (35) with some Caucasians (11), while UAJ students were mostly Caucasians (28) with a minority of Alaska Natives (13). Alaska Native students were comprised almost equally of members from Southeast Alaska Indian tribes, such as Tlingits, Haidas, and Tsimshians (21) and northern Alaska Native groups such as Eskimos, Aleuts, and Athabaskans (27).

All but two of the Navajo students were classified as rural (having spent the majority of their years in a community with a population of 20,000 or fewer). Most of the Alaska Natives were also rural

(40 of 48) while most of the Caucasians came from urban backgrounds (27 of 39). Fifty of the Navajo students spoke English as their second language, as did eight of the Eskimo students; all others spoke English as their first language.

Sex distribution showed 81 female subjects and 74 males. Student ages ranged from 17 to 57 years. A majority of the youngest students (ages 17-20) were found at SJ; mid-age range students (ages 21-24) were primarily from NCC; and most of the students over age 25 were from UAJ. All students were enrolled in beginning-level English courses. At UAJ and NCC, all students were taking either developmental reading or writing, while at SJ, which had a smaller student population, students in freshman composition were tested as well as those in developmental English courses.

Instrument Selection

Five learning style instruments were evaluated for possible use: The Canfield Learning Style Inventory, Form S-A (1976); the Educational Activities Learning Styles Inventory (1983); the Grasha-Riechmann Student Learning Style Scales (1975); Hills Cognitive Style Mapping (1976); and Kolb's Learning Style Inventory (revised 1985). Each instrument was rated on the following criteria: 1) type and variety of learning styles components measured by the instrument; 2) availability of statistical data on reliability and validity of the instrument; 3) simplicity of vocabulary and clarity of instructions, especially for ESL students; 4) applicability of results for both school and career choices; 5) ease of administration and scoring.

Since no single learning style inventory fulfilled all the desired criteria, the authors selected two instruments, the Educational Activities LSI and the Kolb LSI, which appeared to provide a balance in terms of learning style factors measured.

The Kolb LSI is a short 12-item inventory which classifies students by four different styles according to their dominant cognitive processes:

Divergers: Learners who combine concrete experience (feeling) with reflective observation (watching).

Assimilators: Learners who combine reflective observation (watching) with abstract conceptualization (thinking).

Convergers: Learners who combine abstract conceptualization (thinking) with active experimentation (doing).

Accommodators: Learners who combine active experimentation (doing) with concrete experience (feeling).

The Kolb had more statistical data available about it than any of the other instruments, perhaps because it is so widely used. It was also the only inventory which was easily applicable to career counseling as well as advising students about class choices.

The Educational Activities LSI results break down into more specific categories which relate to classroom teaching strategies. We looked at three main variables which seem to be measured by this inventory:

Learning Input Mode: the student's most effective modality for learning, i.e., auditory, visual, or tactile.

Learning Output Mode: the mode in which the student prefers demonstrating this learning, i.e. oral or written.

Social Interaction: reflection of the student's preference for learning with a group or learning alone.

The Educational Activities LSI has 45 items. Its vocabulary is suitable for ESL students, and its results are easy for students to understand and apply. A special feature of this inventory is that it is available on a computer disc so that it can be administered on an individualized basis with students receiving immediate feedback.

Procedure

The inventories were administered during English class sessions; the process took approximately forty-five minutes. Students were first given a very brief introduction to the concept of learning styles, and it was explained that there were no "right" or "wrong" answers to these inventories. They were then asked to fill out an informational cover sheet to give researchers anonymous demographic data. The Kolb LSI was administered first, followed by the Educational Activities LSI. Both tests are untimed and take from ten to twenty minutes to complete. Because of the difficulty level of some of the vocabulary on the Kolb for ESL students, the terminology was explained in both English and Navajo at NCC.

The Kolb LSI can be self-scored, but because of time restraints, these inventories were scored by the researchers and returned to the students at a subsequent class session. The Educational Activities LSI's were computer-scored; individual learning style profiles were provided for students, as well as a class learning style profile for the instructor.

Results and Discussion

Kolb LSI

Test results revealed significant differences between Native and Caucasian students in distribution among the four learning styles.

A chi-square analysis showed that Caucasian students were evenly distributed among all four styles and appeared similar to Kolb's norm group ($x^2 = 2.7$, df = 3, $p \blacktriangleright .20$). However, both Native groups demonstrated a recognizably different pattern with high significance levels for both Alaska Natives ($x^2 = 17.8$, df = 3, $p \blacktriangleleft .001$) and Navajos ($x^2 = 43.4$, df = 3, $p \blacktriangleleft .001$). These groups showed a predominance of students concentrated in the Assimilator category, followed by a high number in the Diverger category. There was no significant difference between the two Native groups ($x^2 = 2.51$, df = 3, $p \blacktriangleright .20$).

The fact that Native students were predominantly Assimilators or Divergers is not surprising since these are the two learning styles which emphasize "reflective observation." This finding substantiates other studies which indicate that Native American children commonly learn through modeling or imitation of actions demonstrated by parents or other authorities (Riner, 1979). However, Assimilators also favor "abstract conceptualization," a learning style characterized by Kolb as analytical and logical. This definition does not appear to be congruent with the pervasive image of Native Americans as holistic, non-analytical students who are dominated by the right-hemisphere of their brains (Cattey, 1980; Ross, 1982).

A stepwise multiple regression was computed to see which demographic factors were most successful in influencing two major quantitative determinants of the four Kolb styles (i.e., active vs. reflective and concrete vs. abstract). Age, sex, class level (developmental vs. regular freshman English), rural vs. urban, and ethnicity were all considered as possible influencing factors. Ethnicity was the only variable that appeared to significantly influence the active vs. reflective determinant ($F = 13.29$, df = 1,163, $p \blacktriangleleft .001$); both groups of Natives tended toward reflective learning while Caucasians preferred more active learning. In determining whether students were concrete or abstract learners, rural vs. urban was the most significant variable ($F = 4.04$, df = 1,163, $p \blacktriangleleft .05$). Rural students appeared to be more abstract while urban students were more concrete. Sex, age, and class level were not significant factors in either prediction.

The high incidence of rural learners reported to be abstract learners was contrary to our expectation and may be attributable to a discrepancy in testing procedure. Most of the rural students were Navajo, and translations of difficult Kolb terminology were given to these students in their native language. Since most of the terms translated applied to the category of abstract conceptualization (e.g., "rational," "analyze"), it appears that these instructions may have unintentionally predisposed these students in favor of these terms. This influence is suspected because the other rural students,

Alaskans, who spoke English as their native language and did not receive translations, did not show this preference for abstract conceptualization.

Both variables (rural vs. urban and ethnicity) were examined as possible main effects in a multiple analysis of variance with the two Kolb quantitative factors (active vs. reflective and concrete vs. abstract) as dependent variables. In this combined analysis, ethnicity was the only significant multivariate main effect ($F = 6.87$, $df = 2, 160$, $p < .001$), a finding which supports the hypothesis that Native students have significantly different learning styles from non-Natives.

Thus, on the Kolb LSI, cultural background appeared to be a more precise predictor of learning style than any other factor. Furthermore, the learning styles of the two different Native groups (Alaska Natives and Navajos) were more similar than dissimilar, despite their disparate geographical and social environments.

Educational Activities LSI

The results of this inventory showed differences between Navajo and Alaska Native students as well as differences between Native and Caucasian students. Learning input mode was the first variable examined; students were asked to list their preferences from among visual, auditory, and tactile modes. The major difference here occurred between the Navajo students and the other two groups. The dominant mode for over half of the Navajo students was tactile; this preference was significantly higher for them than for Caucasians ($x^2 = 10.89$, $df = 1$, $p < .01$) or for Alaska Natives ($x^2 = 8.7$, $df = 1$, $p < .01$). This preference may be a reflection of Navajos' advanced motor skills. These abilities are well demonstrated by their expertise in detailed craftwork and in technical fields such as electronics.

Conversely, a majority of both Alaska Natives and Caucasians preferred visual input. The visual orientation of the Alaskan students was most marked for the Caucasians, who were more visually oriented than Alaska Natives ($x^2 = 4.91$, $df = 1$, $p < .05$) and Navajos ($x^2 = 24.10$, $df = 1$, $p < .001$). However, the Alaska Native students were also more visual than the Navajos ($x^2 = 9.1$, $df = 1$, $p < .01$). This preference indicates a desire to be able to picture information as well as to hear it. It is important to emphasize that visual input involves much more than providing reading assignments for students; it also includes graphic presentation of information through such devices as charts, pictures, diagrams, and computer displays.

Responses on auditory input showed ethnic differences between Native and Caucasian students. Both Alaska Natives

($x^2 = 4.46$, df = 1, $p < .05$) and Navajos ($x^2 = 3.74$, df = 1, $p < .10$) were more auditory than Caucasians, although none of the three ethnic groups showed aural input as their dominant mode. Though less than 25% of any group selected aural input, the lecture method is the predominant mode of teaching in college. Instructors should keep in mind the words of one Alaska Native student who said, "I don't like the instructor to drown us with lectures. They should just talk casually and not rush into everything. I dislike instructors who talk like their mouth is running from a fire."

Learning Output Mode revealed further similarities between the two Native groups. Both Navajos and Alaska Natives preferred to demonstrate knowledge in written form while Caucasian students preferred oral expression. Alaska Natives showed a definite tendency toward written expression ($x^2 = 3.0$, df = 1, $p < .10$), although it was not statistically different from that of Caucasians ($x^2 = .68$, df = 1, $p < .20$). However, differences between Navajos and Caucasians were statistically significant on both the Navajo preference for writing ($x^2 = 5.05$, df = 1, $p < .05$) and the Caucasian preference for oral communication ($x^2 = 3.3$, df = 1, $p < .10$).

The Native students' preference for expressing themselves in written rather than oral form confirms the authors' experience in the classroom. This finding seems superficially to discount the Native American oral tradition of great storytellers passing on legends from generation to generation. However, it must be remembered that these students were asked for their preference only in an academic setting, not at home or among friends. The desire not to be asked to verbally volunteer answers in front of classmates is consistent with linguistic studies which show Natives are reluctant to perform orally for authorities, especially under time pressure (Scollon & Scollon, 1981). Another important factor to consider is that a majority of the Native students tested are ESL students who, although shy to speak English in school, are highly articulate in Navajo, Yupik, or Inupiak outside of class.

All three groups were unanimous in choice of learning style, which involved student preferences to learn alone or in a group. Individual study was selected over group study by the majority of Navajo, Alaska Native, and Caucasian students. There were no significant differences among the three groups on either individual learning ($x^2 = 76$, df = 2, $p > .20$) or group learning ($x^2 = .20$, df = 2, $p > .20$). The vehemence with which all three ethnic groups rejected group learning was surprising, as this finding contradicts other research, which shows that Native Americans enjoy peer learning opportunities and benefit from small group work (Philips, 1972). The reason for this discrepancy could be that this particular item on the inventory is

biased against group learning, or the results may be indicative of students who have been "successfully" conditioned to adapt to the individualistic emphasis in school systems.

Table 1 summarizes the preferences of the three ethnic groups for each Educational Activities LSI variable: Input Mode, Output Mode, and Social Learning Style. While this inventory highlighted some further differences between Native and Caucasian students (Output Mode), it also showed differences between the two Native groups (Input Mode). Since the Navajo are a much more homogenous population than the Alaska Native students tested, some such differences are to be expected. Further testing is necessary to explore the contrasts as well as the similarities between Native American groups.

Table 1
Summary of Educational Activities LSI Results

	Navajo	Alaska Native	Caucasian
Learning Input Mode (visual, auditory or tactile)	Tactile 58.8%	Visual 66.7%	Visual 87.2%
Learning Output Mode (written or oral expression)	Written Expression 75%	Written Expression 62.5%	Oral Expression 56.4%
Social Learning Style (individual or group study)	Individual Study 67.6%	Individual Study 75%	Individual Study 75.8%

Recommendations and Conclusions

Once developmental educators diagnose their students' learning preferences, how can they use them to improve student success rates? There are two major ways in which such information can be used to strengthen the performance of college students.

First of all, sharing the results of learning style inventories with students raises an important self-awareness, which students may have sensed but never before articulated. The response received when discussing results with students was one of surprised recognition: "Yes, that type fits me!" students would often declare. The Kolb LSI

is particularly beneficial in that it contains suggestions about how students can become more flexible learners by expanding their repertoire of learning strategies. Openness to becoming proficient in a number of different learning situations is critical to college student success since students will be required to take a large variety of courses in different disciplines. While a learning style analysis may help a student choose a major or career based on learning strengths, it does not mean the student will be able to avoid all classes which emphasize other skills or alternative approaches.

Just as students must learn to be adaptable in learning style, however, so should instructors strive to expand upon their current teaching strategies. An effective way to initiate such change is to diagnose simultaneously the learning styles of teachers as well as students. This procedure can be enlightening for instructors, for they can see now their preferred learning styles differ from those of their students. Once instructors become aware of such variations, it is easier to understand why some favorite teaching techniques may not be effective with particular student populations.

On Table 2, some specific pedagogical strategies are suggested for students who have taken the two inventories administered in this study. The Kolb types are listed horizontally, and the educational activities categories are listed vertically. For example, the students who are classified as assimilators and scored high on tactile input (such as the Navajo sample) would benefit from making physical models and experimenting with mind-mapping techniques. Considering the high attrition rate of minority students, it behooves instructors to use all of their knowledge and energy to adapt the methods and materials used, particularly in developmental classrooms, to match the learning styles of the students.

Yet we as educators have much left to be done in the area of learning style research. The above suggestions are necessarily tentative as much remains to be resolved about the validity and reliability of these self-report inventories. In this examination of different instruments, it became clear the definitions of learning style and what components should be tested for differ radically; there is no standard yet in the field. Are such instruments theoretically sound and free from cultural bias? Do they measure the skills which instructors want measured? These questions must be explored through further research studies before definitive recommendations can be given based upon learning style inventory results.

Testing of different student populations is also essential to add to the body of learning style knowledge. Are other minority students as similar as Navajos and Alaska Natives, or would Black and Hispanic students exhibit an entirely different learning profile?

Table 2
Teaching Strategies to Match Student Learning Styles

Learner Styles	#1 Diverger (concrete and reflective)	#2 Assimilator (reflective and abstract)	#3 Converger (abstract and active)	#4 Accommodator (active and concrete)
Visual Input	Textbooks; handouts; posters; lecture information outlined or written on board. Student/peer or student/teacher interaction with material. Emphasize "people" aspects.	Written material; films; charts, maps, graphs, tables. Emphasize theories and abstract concepts.	Same as #2, but emphasize answers to questions, solutions to problems, and practical application.	Same as #1, but encourage students to "try something" with information.
Auditory Input	Lectures with discussion; tapes; slide/cassette programs; filmstrip/cassette programs; brainstorm; emphasize "people" aspect of information.	Lectures, tapes; radio; Emphasize theories and concepts.	Same as #2, but emphasis as above.	Same as #1.
Tactile Input	Emphasize note-taking skills; encourage use of 3x5 cards for vocabulary. Practice with peers.	Develop flowcharts, models, charts, graphs, and do mind-mapping of vocabulary and concepts and theories.	Same as #2, but encourage student to apply in different situations. Use computer assisted instruction. Encourage typing.	Emphasize reading using a reading/study technique; utilize a note- taking technique. Do experiments.

Learner Styles	#1 Diverger (concrete and reflective)	#2 Assimilator (reflective and abstract)	#3 Converger (abstract and active)	#4 Accommodator (active and concrete)
Individual Study	Discuss completed homework assignments in class; encourage group interaction after individual study phase.	Probably the assimilator preferred style. Work and review for tests alone; individual projects.	Same as #2.	Same as #1. Use work texts with exercises.
Group Study	Role play; small group projects; rote oral practice, i.e. flash cards, etc.	If group work is necessary, assign clearly defined roles to each participant.	Same as #2.	Same as #1. Use simulations, contests, games.
Written Output	Written tests, term papers, reports–prepared with peers. Allow creative leeway.	Same as #1, but do alone; emphasize due date; prepare timeline.	Same as #2, without emphasis on due dates and timelines. Encourage projects and case studies applying ideas learned.	Same as #1. Emphasize rewriting. Design own projects. Encourage "interview"type project; notebooks, journals.
Oral Output	Oral tests, projects, reports. Group projects and presentations.	Same as #1. Emphasize due date; prepare timeline.	Same as #1.	Same as #1. Design own projects. Encourage interviews.

Similarly, do developmental college students possess learning style strengths and weaknesses which are different from those of non-developmental students, thus indicating the necessity of special teaching strategies which can be universally applied to all developmental programs?

As yet, not nearly enough is known of cultural distinctions in learning style and world view, child rearing, value systems, nor influence of language on thought processes and learning styles. Despite the many unanswered questions in these areas, instructors must nevertheless continue to search for ways to be more effective in transmitting and encouraging learning for all students. As James Keefe (1979) maintains, "Learning style diagnosis opens the door to placing individualized instruction on a more rational basis. It gives the most powerful leverage yet available to analyze, motivate, and assist students in school. As such, it is the foundation of a truly modern approach to education."

REFERENCES

Brown, J. F., & Cooper, R. M. (1983). *Learning styles inventory.* Freeport, NY: Educational Activities, Inc.

Canfield, A. A. (1976). *Canfield learning styles inventory, Form S-A.* Rochester, MI: Humanics Media.

Cattey, M. (1980). Cultural differences in processing information. *Journal of American Indian Education, 20* (1), 23-29.

Claxton, C. S. (1978). *Learning styles: Their impact on teaching and administration.* (AAHE-ERIC/Higher Education Research Report No. 10).

Dunn, R., DeBello, T., Brennan, P., Krimsky, J., & Murrain, P. (1981). Learning style researchers define differences differently. *Educational Leadership, 38,* 372-375.

Dunn, R., & Dunn, K. (1978). *Teaching students through their individual learning styles: A practical approach.* Reston, VA: Prentice-Hall.

Dunn, R., Dunn, K., & Price, G.E. (1975). *Learning style inventory.* Lawrence, KS: Price Systems, Inc.

Gardner, R. C. (1980). *Learning styles: What every teacher should consider.* (ERIC Document Reproduction Service No. 198 059).

Grasha, A. F., & Riechmann, S. W. (1975). *The Grasha-Riechmann student learning style scales.* Cincinnati, OH: University of Cincinnati.

Guilmet, G. M. (1979). Instructor reaction to verbal and nonverbal learning styles: An example of Navajo and Caucasian children. *Anthropology and Education Quarterly, 10,* 254-266.

Guilmet, G. M. (1976). *The nonverbal American Indiana child in the classroom: A survey.* (ERIC Document Reproduction Service No. 255 336).

Hill, J. E. (1971). *Personalized education programs utilizing cognitive style mapping.* Bloomfield Hills, MI: Oakland Community College Press.

Kaulback, B. (1984). Styles of learning among Native children: A review of the research. *Canadian Journal of Native Education, 11,* (3), 27-37.

Keefe, J. W. (Ed.). (1979). *Student learning styles: Diagnosing and prescribing programs.* Reston, VA: National Association of Secondary School Principals.

Kleinfeld, J. S. (1970). *Cognitive strengths of Eskimos and implications for education.* Fairbanks: University of Alaska.

Kolb, D. A. (1981). *Disciplinary inquiry norms and student learning styles: Diverse pathways for growth.* San Francisco: Jossey-Bass.

Kolb, D. A. (1985). *Learning-style inventory* (Rev. Ed.). Boston, MA: McBer and Company.

Martin, J. C. (1978). Locus of control and self-esteem in Indian and white students. *Journal of American Indian Education, 18* (1), 23-29.

Osborne, B. (1985). Research into Native North Americans' cognition: 1973-1982. *Journal of American Indian Education, 24* (3), 9-25.

Philips, S. U. (1972). Participant structures and communicative competence: Warm Springs children in community and classroom. In C. Cazden et al. (Eds.), *Functions of language in the classroom (pp. 370-394). NY: Teachers College Press.*

Posey, E. J. (1984). Learning style inventory: Implementation research. Journal of Developmental and Remedial Education, 7 (3), 16-18.

Riner, R. D. (1979). American Indian education: A rite that fails. *Anthropology and Education Quarterly, 10,* 236-253.

Ross, A. C. (1982). Brain hemispheric functions and the Native American. *Journal of American Indian Education, 21,* (3), 2-5.

Scollon, R., & Scollon, S. B. K. (1981). *Narrative, literacy and face in interethnic communication.* Norwood, NJ: Ablex Publishing Corporation.

Shade, B. J. (1984). *The perceptual process in teaching and learning: Cross-ethnic comparisons.* (ERIC Document Reproduction Service No. 252 634).

Wauters, J., Merrill, J., & Black, D. (1984). Exploring learning styles of minority students: An Alaskan study. *Journal of College Reading and Learning, 17,* 101-111.

AUTHOR NOTES

We gratefully acknowledge the assistance of Dr. Phillip Hocker, associate professor of Education at the University of Alaska-Juneau, in statistical analysis of the data.

A THREE-DIMENSIONAL APPROACH TO TEST-TAKING INSTRUCTION.

Sandra U. Gibson
Georgia State University

Students who are having difficulty with test-taking skills are being helped at the Georgia State University learning assistance center with a three-dimensional approach. Based on diagnostic interviews students may be channeled into one, two, or three directions for working on various aspects of test-taking proficiency—preparation, test-wiseness, and anxiety management. Such an approach reflects Materniak's view (1982) that study skills should be treated as "integrated components of a learning system" (p. 4).

Although formal instruments for evaluationg study skills [e.g. *Brown-Holtzman Survey of Study Habits and Attitudes* (Brown & Holtzman, 1967), *California Study Methods Survey* (Carter, 1958), and the *McGraw-Hill Basic Skills System: Study Skills Test* (Raygor, 1970)] are available, these instruments all have the inherent limitation of relying primarily on self-report. Because there may be significant discrepancies in what students report about their study habits and what they actually do as they study or take tests, diagnostic interviews during which the learning skills counselor observes students' preparation and test-taking strategies may be more helpful in determining the sources of their difficulties with tests. Since students are often unsure of the source of their test-taking difficulties and make statements such as, "I just don't do well on tests," the objective of the diagnostic interview is to determine at what points their preparation, test-taking, or anxiety management is breaking down.

Identifying Preparation Difficulties

Several techniques are available to the learning skills counselor in determining a student's study habits. Two valuable methods of observation are thinking aloud and underlining. In applying these techniques, the learning skills counselor may choose either to let the student use his/her own textbook or to use selections from textbooks familiar to the instructor. Regardless of the text used, the important

thing is the student's demonstration of study techniques.

Thinking-aloud is a technique used in investigations of the reading process (Olshavsky, 1977; Gibson, 1983). The student reads, aloud or silently, and stops during reading to report on his/her thought process. The learning skills counselor may model this technique, stopping after a designated amount of text, perhaps a sentence or clause, to report thoughts. The think-aloud technique permits the learning skills counselor some access to the inner workings of the student's mind. To borrow from Ken Goodman (1973), the technique gives us "a window on the thinking process."

A description of a student named "Sid" can illustrate the use of thinking aloud to diagnose a student's preparation strategies. Sid came to the learning assistance center because he was repeatedly failing tests in his psychology class. After a discussion of the problem he was experiencing, the counselor explained the reason for looking at his test-taking difficulties in relation to both his preparation skills and his test-taking abilities. Sid and the counselor discussed the think-aloud procedure, and the counselor demonstrated how to do it. Next, Sid was asked to think aloud as he began reading a chapter on motivation in his psychology text. As he thought aloud, it was apparent that Sid's approach omitted the title, the chapter outline, and the headings and began immediately with the reading. His thinking aloud as he read reflected this lack of attention to the top-level structure of the text. He found it difficult to identify the topic and main points and to follow the structure of the text.

For students having reading difficulties, thinking aloud can also reveal the student's inability to relate the abstract ideas from the text to real-world phenomena. Bloom and Broder (1950) identified this difficulty as a common tendency among low ability college students. "Lynn," another student at the learning assistance center, was having trouble with a difficult textbook on mass media. On her mid-term exam, her professor had commented that her essays were too skimpy and needed more details and examples. Having demonstrated thinking aloud, the learning skills counselor asked Lynn to use her own textbook and to think aloud using a chapter she had not yet read. The chapter she selected dealt with the reciprocal relationship between popular culture and politics. The ideas presented in this chapter were conceptually difficult and quite abstract, yet Lynn's thinking aloud indicated that she was making no attempts to interpret the points in terms of more concrete, real-world phenomena. For example, the text discussed popular culture but gave no examples of what was meant by the term. Lynn showed no indication of substituting a more concrete term such as *movies* or *television programs* to make the term *popular culture* more understandable. Her professor's

criticism that her exam essays lacked examples seemed consistent with what her thinking aloud indicated about her textbook reading strategies.

Thinking aloud can also reveal a student's inability to stay on track, the tendency to digress too far from the task to be productive. "Fred," who was reading and thinking aloud about his history text, would periodically wander far astray when something in the text reminded him of something from a television program he had seen or a book he was reading. Although his associations were understandable, his digressions were so lengthy that he would forget the point being made in the text. Other students demonstrating this tendency to digress show through thinking aloud that they cannot attend to more than one clause without being diverted. Their wanderings sometimes involve expression of their anxiety about the course or about a test they are preparing for. Frequent digressions osf this nature suggest that one major difficulty is an inability to maintain concentration long enough to understand what they are reading.

Like thinking aloud, underlining can be another means of ascertaining students' understanding of their texts and their judgments about what is important. It was apparent from Sid's underlining in his textbook that he did not use the subheading as an indication of the topic of the section or recognize the coherence of the text. Underlining can also reveal whether a student has trouble making decisions about what is important. Where too much is underlined, the student may not be able to make decisions about the relative importance of information. Underlining can also be indicative of whether the student has followed the author's train of thought or is, instead, going off on tangents. Underlining interesting examples or sensational asides instead of main points and important details gives a powerful clue about the student's focus.

Like thinking aloud, then, underlining can provide valuable information to the learning skills counselor attempting to assess a student's preparation skills. Both strategies can indicate the extent to which the student is paying attention to the important information in the text.

Assessment of Test-taking Strategies

Most students with problems "taking tests" give evidence of poor test preparation skills. In addition, they may demonstrate little use of test-wiseness skills, the ability to read the test thoroughly, reason clearly, or proceed logically. Occasionally there is a student who has actually prepared quite well but has deficits in test-taking skills.

"Nan" illustrates what Bereiter and Engelmann (1966) have

termed "one-shot thinking," a contrast to logical, sequential reasoning. Instead of setting up test questions and proceeding sequentially, she would make an impulsive attempt at an answer. Nan brought to the center a history test which she had failed. One portion of the test that she had done poorly on was an unusual matching task. In column one were 20 events to be matched with 5 events or eras in column two. The purpose was to indicate the approximate time period of the events in column one. The instructions for this portion of the test were to write the letter from column two that corresponded to events in column one. Nan's solution was to write in the blank the *actual date* of the events in column one. During discussions, Nan indicated that she believed she had a learning disability that prevented her from being able to do the task as assigned. She believed, too, that were it not for this learning disability, she would have immediately been able to do this task—instantly knowing what letter to put down for each event. Because it seemed appropriate to influence her perception of how such a task might be approached, the counselor set up a time line with the dates from column two, identifying a date for each event in column one, and subtracting to determine the match. Having watched the counselor work on this matching test, Nan expressed relief that she could not answer the question instantaneously. It appeared important for her to hear that this was a difficult task, that the directions were somewhat vague, and that it might not be possible to arrive instantly at an answer, but instead might be necessary to sketch a diagram and proceed step by step.

Observing how a student tackles an exam may reveal a corollary to this tendency toward "one-shot thinking." Unsuccessful students often skim the stem of the question and each of the responses. Successful test-takers, on the other hand, usually read each question carefully, paying attention to each word, knowing from experience that one wrong word can make an answer incorrect. Asking a student to think aloud or to underline key terms can again be diagnostic. It is often helpful to ask students to begin by reading the question and answer aloud. Unsuccessful students can be observed inserting or omitting important, meaning-altering words. "Heather," who was having trouble with multiple-choice tests in economics, displayed a unique tendency. When she read the questions aloud, it was apparent that she would pick up words from one of the low options, such as C, and insert them in a higher option, such as B. Needless to say, this reading problem created havoc with her test-taking. The simple strategy of physically covering up lower options reduced this tendency.

In addition to revealing idiosyncratic reading habits, reading the question and options aloud can also reveal a failure to stress important words in a question. One of the questions from Sid's psychology exam began, "When a kitten is blinded so that it sees only vertical lines . . . ." When Sid read this portion of the sentence aloud, he did not place stress on the word "vertical." This clause appeared within a lengthy sentence that suggested to an experienced test-taker that "vertical" should be stressed. The fact that Sid did not stress "vertical" suggested at least part of the reason why he had missed this question. The correct answer included a phrase related to horizontal lines. A student who stressed "vertical" would probably have expected the correct answer to contain the word "horizontal."

Whether a student can be trained to place stress on appropriate words in multiple choice questions or whether such training should even be attempted is questionable since stress is probably more a symptom of a reading problem than a problem in itself. Nevertheless, having the student read the stem and options aloud may provide important information to the learning skills counselor and may help the student realize that, in multiple choice tests, every word must be read and considered carefully.

Having students read the questions aloud and think aloud about the answers can also be a revelation of the student's way of thinking about language. "Helen" was an interesting example of the value of diagnosis of this type. She was a bright, 36-year-old woman enrolled in nursing. She described her problem with multiple-choice test-taking as confined to nursing exams. She made excellent grades on multiple choice tests in biology or other science courses, but was at the bottom of her class on most nursing exams. On the rare nursing test on which she scored in the high 80s, the rest of the class performed poorly. Helen's professors were concerned that a student who appeared to be intelligent and conscientious was failing nursing classes. For this reason, they were very cooperative and sent the learning skills counselor her mid-term and final from the preceding quarter along with the keys to the tests. As Helen read aloud the items of the test, a pattern began to emerge. On items that were written in an objective, scientific style, such as those that asked for levels of medication, Helen was accurate. However, much of the content of this particular course related more to counseling concepts and language than to science. Items that covered this type of content tended to be written in a more abstract and subjective style, and Helen was not attuned to the subtle, stylistic connotations. She was quick to catch on once her counselor began discussing the connotations of various

words and phrases from the test. It seemed that, despite being very attuned to objective, precise, scientific language, she could not see the inference inherent in a more subjective style.

Helping students to improve their test-taking strategies requires an analysis of their current test-taking behaviors. The learning skills counselor can be in a better position to offer appropriate strategies if precise identification of problems is made. The examples included here are illustrative rather than exhaustive; for purposes of clarity one type of problem per student was discussed. In reality, of course, one student may demonstrate any number of difficulties. Reading and thinking aloud using their own test questions or items provided by the learning skills counselor offer helpful information about a students' thinking in testing situations.

Test Anxiety

For students who have made inadequate preparation for a test, anxiety is probably an appropriate response. Other students, however, have adequate test preparation and test-taking skills, but are so consumed by anxiety that they are unable to perform up to abilities. During diagnostic interview, students experiencing excessive test anxiety typically discuss this problem as a primary concern. It may not be necessary for the learning skills counselor to inquire whether anxiety management is a problem.

Karen, a Ph.D. candidate in education, experienced extreme test anxiety during in-class essay exams. She brought to the first interview a sample of writing she had done at home. This sample showed that, away from pressure, she was a competent, even gifted, writer. Under the pressure of exam conditions, however, she blocked and was unable to demonstrate her mastery of assigned material. In courses that required in-class essay exams, she made B's; in courses that did not have this requirement, she made A's. She clearly had the intelligence and requisite writing, preparation, and test-taking skills to be successful.

Anxiety management was a crucial goal, since Karen's doctoral comprehensive exams (which are written) were scheduled for the following quarter. Her learning skills counselor referred her to a stress management counselor for training in progressive relaxation and desensitization. For such techniques to be appropriate, a student must be committed to serious work for an extended period of time. For a student like Karen, whose success largely depended on learning to manage stress, such a commitment was necessary. After having learned new ways of controlling anxiety, she reported a significant improvement in her ability to write in-class essay examinations.

Conclusion

Anxiety management, preparation, and test-taking skills are each important to a student's success on exams. Assessing a student's strengths and difficulties during diagnostic interviews is essential for appropriate learning assistance and, where necessary, referral to other counselors. If preparation skills are insufficient, additional work on textbook reading, note-taking, and test preparation strategies may be necessary. If test-taking skills are inadequate, practice exams from sources such as *How to Take Tests* (Millman & Pauk, 1969) may be useful. If anxiety management is a problem, relaxation training (Wolpe & Lazarus, 1966) and systematic desensitization (Wolpe, 1969) may be appropriate. These three areas comprise an effective three-dimensional approach to test-taking instruction.

REFERENCES

Bereiter, C., & Englemann, S. (1966). *Teaching disadvantaged children in the preschool.* Englewood Cliffs: Prentice Hall.

Bloom, B. J., & Broder, R. J. (1950). *Problem-solving processes of college students.* Chicago: University of Chicago Press.

Brown, W. F., & Holtzman, W. H. (1967). *Brown-Holtzman survey of study habits.* New York: The Psychological Corporation.

Carter, H. D. (1958). *California study methods survey.* Los Angeles: California Test Bureau.

Gibson, S. U. (1984). The reading strategies used by proficient adult readers to comprehend difficult expository text. Unpublished doctoral dissertation, Georgia State University. 1983 *Dissertation Abstracts International, 44,* 2102-A.

Gilmore, M. T., Sack, A., & Yourman, J. (1984). *88 Passages* (3rd ed.). New York: College Skills Center.

Goodman, K. (1973) Miscues: Windows on the reading process. In K. Goodman (Ed.), *Miscue analysis: Applications to reading instruction.* Urbana: ERIC Clearinghouse on Reading and Communication Skills, National Council Teachers of English.

Materniak, G. (1982). Study skills: A practical application of information-processing theory. In A. S. Algier & K. W. Algier (Eds.). *Improving reading and study skills.* San Francisco: Jossey-Bass.

Millman, J., & Pauk, W. (1969). *How to take tests.* New York: McGraw-Hill.

Olshavsky, J.E. (1977). Reading as problem solving: An investigation of strategies. *Reading Research Quarterly, 12,* 654-674.

Raygor, A. (1970) *McGraw-Hill basic skills system: Study skills test. Monterey: CTB/McGraw-Hill.*
Wolpe, J. (1969). *The practice of behavior therapy.* Oxford: Pergamon.
Wolpe, J., & Lazarus, A. A. (1966). *Behavior therapy techniques: A guide to the treatment of neuroses.* Oxford: Pergamon.

READING, WRITING, AND REASONING FOR HEALTH SCIENCE MAJORS

Pamela Cervi
Fullerton College
Susan Schaefer
University of California, Irvine

Overview

Today, students planning a career in the health science professions must be prepared to meet the rapid advances in the knowledge and technology of their fields. The demand to learn vast amounts of information and to be able to analyze, synthesize, and evaluate that information effectively is paramount. In addition, students must be able to communicate effectively through oral and written language. Yet, the undergraduate preparation of health science majors is often narrowly focused in science and math with students only completing the minimum number of courses in humanities and social sciences. As a result, health science students have difficulty with analytical reading, writing, and critical thinking skills. When confronted with the Medical College Admission Test (MCAT), Dental Admission Test (DAT), or Optometry College Admission Test (OCAT), these students often have very high scores on the science and math sections, but experience problems with the reading comprehension, essay, and quantitative analysis portions.

In an effort to strengthen the reading, writing, and reasoning skills of health science majors, the Reading Department at California State University, Fullerton (CSUF), and the Learning Skills Center at University of California, Irvine (UCI), have developed specialized courses. At CSUF, a one unit credit course, Critical Reading (Read 103G) was developed in 1982 with the two-fold purpose of fostering critical thinking and reading skills and preparing students to meet the demands of the reading comprehension section on the MCAT and DAT. Students enrolled in the course have usually been juniors and seniors, and most have been native speakers of English. At UCI, a non-credit course, Reading, Writing, and Reasoning for Health Science Majors (Bio Sci 98), was developed in 1985. The goal of this class was the development of analytical reading, writing, and thinking skills; however, the number of Asian students who enrolled

in the course has resulted in the addition of the secondary and tertiary goals of background enrichment and language development.

Although taught at different universities, Read 103G and Bio Sci 98 share an underlying belief in the close relationship between reading, writing, and reasoning. Historically, research has substantiated this relationship. Decades ago, E. L. Thorndike (1917) stated that reading was thinking, and as recently as 1984, Barbara Smith commented that writing was also a critical act of thinking. Lewis (1985) stressed these connections when she described reading and writing as shared developmental processes with thinking as the foundation. Other research indicates that both reading and writing involve meaning generation and creativity (Tierney and Pearson, 1983) and that the construction of meaning is affected by the reader's/writer's view of the world combined with prior knowledge and experience (Wittrock 1983; Cooper & Petrosky, 1976).

Besides verifying the relationship between reading and writing, current research also provides a foundation for the learning strategies included in Read 103G and Bio Sci 98. Specifically, studies show that writing exercises which are purposely designed to assist comprehension or to increase the retention of factual material generally yield positive results (Stotsky, 1983). Both courses offer students frequent opportunities for reading, for thinking analytically, and then for writing to increase understanding and enhance retention of information.

Strategies

One of the first strategies discussed in Read 103G and Bio Sci 98 is text annotation. When students take graduate entrance exams, they are required to tackle some very complex reading materials and to deal with questions that require higher levels of thought. For example, on the Dental Admission Test (DAT), students are given a lengthy scientific passage to read. This passage is followed by fifty multiple choice questions which must be completed within a certain time limit. The key to this test situation is reading thoroughly before beginning to complete the questions because time constraints do not allow for much rereading

The Optometry College Admission Test (OCAT) presents an even more difficult comprehension task because the study passage is taken away before the student answers the questions. The Medical College Admission Test (MCAT), which contains ten short reading passages from various disciplines and has few literal level questions, presents

yet another test variation. On each of these exams, the use of careful text annotations may help test-takers to handle the task more efficiently.

In class, the benefits of text annotations are discussed to show the students how annotation promotes active involvement (Behrens & Rosen, 1982). Students are also given the opportunity to develop a set of personalized, yet consistent annotations. Meaningful underlining, circling, numbering, asterisks, and other conventional markings are presented as annotation methods.

Then, numerous reading samples similar to test materials and/or materials relevant to health science majors are used to help students practice reading, thinking, and reacting. Students are required not only to mark key ideas and major supporting details, but to record thoughts, main points, vocabulary words, organizational patterns, questions, and personal reactions in the margins. Throughout the exercises, it is emphasized that all annotations must be done *after* reading rather than while *while* reading. As a further aid in developing reasoning skills, students are required to support and justify their annotations either in whole-class or small group discussions.

The second strategy taught is that of summary writing. Students are encouraged to view the summary as a means of restating, in their own words, the content of a passage. The need to focus on the central theme of the passage and to indicate the main supporting points is also emphasized. Using the text annotations as aids in following the six-step process outlined in Behrens and Rosen's text, *Writing and Reading Across the Disciplines* (1982), students are required to write a summary of the material they have just read. After revising their papers, students share and discuss their writing. Throughout the process, students are encouraged to think with the author, to react to the content, to record their reactions in written form, and then to evaluate and justify their responses. These steps encompass all aspects of reading, writing, and reasoning beyond the literal level.

Students are now introduced to Bloom's Taxonomy (1956). After a discussion of each of the six levels—knowledge, comprehension, analysis, application, synthesis, and evaluation—students are provided with opportunities to answer questions on each level of thought. The teacher-generated questions are based on selections the students have used for text annotation and summary writing. As students respond to the questions, they are required to use a metacognitive approach, monitoring their thinking and creating an awareness of what is occurring during the thinking process (Baker & Brown, 1984). Furthermore, to clarify ideas and to reinforce comprehension, students write out their responses.

A final strategy which has proven beneficial to health science majors is that of test-question generation. Most students in the classes purchase test preparation manuals or practice exams for the MCAT, DAT, or OCAT, and from these sources, are able to examine closely the types of questions occurring on the tests. Using short journal articles from different disciplines, students are asked to compose test questions like those found on the graduate level exams they plan to take. There is only one restriction—the questions may not be at the literal level, but must reflect all the other levels of thought in Bloom's Taxonomy. As students complete this exercise, they also have the opportunity to practice their critical reading, marking, and text annotation skills.

One final point that is emphasized in Cooper and Petrosky's (1976) view of reading and in both Tierney and Pearson's (1983), and Wittrock's (1983) research is the importance of basic background to meaning generation. Although no specific strategies are used to increase a student's reference base, the development of a broader background is often a secondary result of a student's interaction with a variety of reading materials and involvement in discussion groups within the course. This is especially true of the Asian students, who may glean much new information from participating in a pluralistic education situation.

Conclusion

Although each of the four strategies described have proven to be beneficial to health science majors, student responses at CSUF and UCI have indicated that text annotation and test-question generation rate the highest. Furthermore, the active involvement with the reading task which results from the use of these strategies was judged to be the best overall outcome of the courses. Students were pleased to find ways to control the test-taking situation and to prevent anxiety and daydreaming. In addition, they felt that they were better prepared to face the reading and writing tasks of graduate school.

REFERENCES

Association of American Medical Colleges. (1984). *Physicians for the twenty-first century—Report of the panel on the general professional education of the physician and college preparation of medicine.* Washington, D.C.

Baker, L., & Brown, A. (1984). Metacognitive skills and reading. In P. Pearson (Ed.), *Handbook of reading research.* New York: Longman.

Behrens, L., & Rosen, L. (1982). *Writing and reading across the curriculum.* Boston: Little, Brown and Co.

Bloom, B. (1956). *Taxonomy of educational objectives.* New York: Longman.

Cooper, C., & Petrosky, A. (1976). A psycholinguistic view of the fluent reading process. *Journal of Reading, 20,* 184-207.

Lewis, J. (1985). Support for reading and writing as shared developmental processes. *Journal of College Reading and Learning, 17,* 67-74.

Smith, B. (1984). *Current issues in higher education.* San Francisco: Jossey-Bass.

Stotsky, S. (1983). Research on reading/writing relationship: A synthesis and suggested directions. *Language Arts, 60,* 627-642.

Thorndike, E. (1917). Reading as reasoning: A study of mistakes in paragraph reading. *Journal of Educational Psychology, 8,* 323-532.

Tierney, R., & Pearson, P. (1983). Toward a composing model of reading. In J. Jensen (Ed.) *Composing and comprehending* (33-46). Urbana, Ill.: ERIC Clearing House on Reading and Communication Skills.

Wittrock, M. (1983). Writing and the teaching of reading. In J. Jensen (Ed.) *Composing and comprehending* (77-84). Urbana, Ill.: ERIC Clearing House on Reading and Communication Skills.

TEACHING OF PROBLEM SOLVING SKILLS

Stefan Bosworth
City College of New York

Many students presume that problem solving skills are inborn; you either have the ability or you do not. In fact, this author believes that problem solving skills can be taught and that most students have the potential to improve their ability to solve problems.

Dr. Marion Brisk, Course Director of Chemistry at the City University of New York medical school, and the author began to develop a problem solving model for the medical school students. The model was developed because a large number of students were having difficulty in problem solving courses such as Genetics and Physiology. Even students who had shown excellent problem solving skills in one course ran into difficulty when put into a course that required slightly different problem solving abilities. The researchers believed that all of the students would benefit from problem solving materials and a problem solving workshop.

Common Errors in Student Problem Solving

Computational Error

Before materials could be developed, common student mistakes had to be analyzed. The most common problem solving mistake was computational error. Students routinely skipped steps in the process of solving problems. Then, if they made a computational error, the students were unable to find the error. In fact, many students never checked their work at all. While this was the most common error made by students, it was also the most easily corrected. All that was required for correction was to require students to list all the steps in solving a problem and to have them consistently check their work.

Misuse of Formulas and Equations

The mistake made with second greatest frequency was the use of a wrong formula or equation. Students often memorize formulas rather than learn them. This is particularly true of students with weak problem solving skills. Students need to understand that a formula is an explanation of a part of reality and that an equation is a tool for defining that part of reality. Since students tend to memorize

formulas, they often use the wrong formula. In the sciences, one variable can make the difference as to which formula to use. For example, when asked to determine the concentration of CO_2 in air given the partial pressure of CO_2 (P_{CO_2}), students frequently use the wrong formula, namely, Henry's Law (concentration =constant x P_{CO_2}). In Henry's Law, the concentration is of the gas in solution, not in air. Students make this error since they have memorized the formula without thinking about its meaning or its application.

It is the job of the educator to help students learn and understand formulas and equations and not merely memorize them. This means that they must know what every formula can do and what it cannot do. Students must also be taught to question whether an answer is even possible given the limitation of the formula. If a student is looking for an atomic weight and comes up with a weight of one gram, or the size of a building and comes up with 10^6 meters, he needs to know that these answers should be immediately questioned because a basic understanding of atomic weights or the heights of buildings can tell him that these answers would not be possible.

Solving the Wrong Problem

The third most frequent error made by students is answering the wrong problem. Students misinterpret what problem they are being asked to solve. To help students avoid this error, the author has the students put on a sheet of paper the information that the problem gives and a list of what unknowns they are solving for. Having done this, they must look at their list of givens or variables and decide what part of the information will be useful in solving the problem. Students usually assume that all the given information or variables must be used to solve a particular problem. This is not true. Listing the given information or variables also helps students to avoid using the wrong formula and/or equation when trying to solve the problem. The students are also asked to plan out solutions to the problem before actually proceeding to solve it.

Ignoring Limits or Imposing Improper Limits

Another common mistake in trying to solve a problem is putting limits and restrictions into a problem that are not there, or not seeing the limits that do exist in a given problem. Listing all the information that is given in the problem helps the student to avoid this pitfall. The author also uses sample problems when working with students that help to illustrate this point.

One illustration useful for showing students that they put limitations on a problem that makes it difficult or impossible to solve, is the following:

> Without your pencil leaving the paper, draw four straight lines through all of the dots in the three-by-three array of nine dots below. (Awickelgner, 1974)

Students routinely see the dots as forming a square and presume they must stay within the square. If they stay within this limitation, the problem is unsolvable; once they realize this limitation does not exist, then the problem is easily solved.

Equating the Most Logical Solution with the Correct Solution

Still another error that students make in problem solving is not looking at the problem from different angles. They will try what appears to be the most logical method of solving the problem, and when that fails, they give up trying to find a solution. Students are afraid to attempt novel approaches. In fact, most problems in the sciences can be approached from a number of different angles and solved in a number of different ways. Often, the method that seems most logical is in fact incorrect. Some students will check their math when the answers look as if they might be incorrect, but very few students will question the basic assumptions that they made when trying to solve the problem. In fact, students are often not conscious of what their initial assumptions were when they started to solve the problem.

A problem used to illustrate the idea that the most logical method of solving a problem is not necessarily the best is the following:

> There are 12 cannonballs. All look alike, but one is the "oddball." The oddball is either heavier or lighter than the other cannonballs. You are supplied with a balance scale that can hold as many cannonballs as you would like on each side of the scale. The problem is, in 4 weighings (4 uses of the scale), find the oddball.
>
> (Awickelgner, 1974)

Ninety percent of the students who do this problem initially divide the cannonballs in half—a solution that, though logical, is incorrect.

Problem Solving Workshop

The author runs a workshop that uses a series of carefully selected problems that, while not difficult to solve, illustrate to the students how easy it is to fall into the pitfalls listed above. In addition, the Learning Center staff utilizes carefully selected problems with individual students that illustrate particular difficulties the students may be having. The workshop begins with an hour-long lecture, in which common problem solving errors are discussed. Then, the workshop instructor hands students ten problems. The students are given an hour to solve these problems. After the hour, whether the students are successful or not, the instructor has them go to the blackboard and explain how they solved, or attemped to solve, the problems. At the end of the workshop the students and instructor go over what went right in the problem solving process and what went wrong. The author has found that the lessons learned from this experience were very helpful to the students in their future problem solving. Using the workshop as a format, the author teaches the students that in successful problem solving, everything must be questioned, including the basic assumptions that are made in the beginning of a problem.

A Model for Problem Solving

Out of the experience of the workshop, Dr. Brisk and the author developed the following four step problem solving model:

Step (1) Problem Analysis. Defining what information is given and what is unknown.

Step (2) Developing a Plan for Solution. Thinking of relationships between givens and unknowns and deciding which formulas and equations would be useful in solving the problem.

Step (3) Performing the Calculations. Doing the arithmetic calculations and checking to make sure that the units used are constant.

Step (4) Evaluating the Answer. Making sure that the answer that results from the calculation is possible and is in fact a solution given the limitations of the formula used and the restrictions defined. Evaluation of the answer also involves checking arithmetic calculations (Bosworth & Brisk, 1986).

The author distributes the model to students who attend the workshop or who come to the Learning Center individually for assistance. Providing a specific model is a very important aspect of teaching problem solving skills. The written, simple, concise model for solving problems gives the students a reference point form which to develop their problem solving skills.

Integration of Problem Solving Skills with Peer Tutoring

Conducting a problem solving workshop and providing a problem solving model are not sufficient to inculcate the basic problem solving skills necessary in the sciences. To accomplish this, the peer tutoring program is utilized.

Virtually all freshmen and sophomores in the City University Medical School attend peer tutoring. Therefore, this becomes an ideal forum for testing problem solving skills. All tutors, as a part of their training, are taught how to integrate problem solving skills into their tutoring. Many of the courses that are tutored in the freshman and sophamore years lend themselves nicely to the teaching of problem solving skills because they are predominantly problem solving courses. Tutors are trained not to give answers to problems but rather to encourage the students to go through the process of solving the problem. The tutor acts only as a guide. If the student is totally unable to solve a particular problem, then the tutor will proceed to solve the problem step-by-step, using the model as a guide. After solving the problem for the student, the tutor gives the student a similar problem. The student now becomes the problem solver, not the tutor; however, the student is guided through the process and made conscious of it by the tutor.

Conclusion

By introducing the problem solving skills in a number of different ways and constantly reinforcing these skills, the instructor helps students with weak problem solving skills become more successful problem solvers. Faculty members in such courses as Chemistry, Biochemistry, Genetics, and Physiology have noted a decline in failure rates since the introduction of teaching problem solving skills. In addition, students find that learning these skills in context facilitates the learning of problem solving skills and the learning of course work.

REFERENCES

Awickelgner, W. (1974). *How to solve problems.* San Francisco: W.H. Freeman and Company.

Bosworth, S., & Brisk, M. (1986). *Learning skills for the science student.* Clearwater, Florida: H & H Publishers.

PROSPECTS FOR IMPROVING HIGHER EDUCATION

Carol Bogue
San Jose City College

What is being done by today's institutions of higher education to improve or to achieve excellence? To address this issue, one must first specify an operational definition of "achieving excellence." Consensus is that colleges and universities, to achieve excellence, must provide basic education needed for life-long learning and occupational success in an ever-changing marketplace in such a way that students reach their intended goals. Recently, all aspects of this requirement have received careful scrutiny, and modifications have been made accordingly.

To provide basic education required for life-long learning and occupational success in an ever-changing marketplace, academicians are reviewing and, in some cases, revising general education requirements and exit competency levels for all degree students.

In addition, they are re-examining the lists of courses required for specific majors, and establishing new majors with an eye toward emerging occupational areas. Quality of courses offered, student expectations, appropriateness of content and relevancy, prerequisites, and course sequence are all being considered in the process. Actually, equal or greater emphasis is being placed on rigor and quality than on course selection and general content for both general education and major requirements.

If these tasks are successfully pursued, progress will have been made toward improving the basic education required for life-long learning and occupational success in an ever-changing marketplace. At the same time, however, higher education has not ignored the rest of the definition, which requires that courses be offered "in such a way that students reach their intended goals." This part of the requirement has perhaps received even more recent attention than the former. Institutions now accept the fact that they can no longer consider themselves "excellent" if/when large percentages of their students fail to successfully complete the coursework offered. Attrition rates, which have risen to unacceptable levels, have been linked to the enrollment of underprepared students. Lee Noel (1978) reports that the enrollment level of an institution is affected directly by its retention rate, and retention rate is affected by the extent to which

an institution admits low-achieving students. Admittance of underprepared students, however, has occurred at ever increasing rates at all types of institutions. Two specific causes explain this phenomenon: the desire to offer educational opportunity to the greatest number possible, the accepted mission of higher education as noted by Keimig (1983), and the perceived need to maintain typical enrollment levels, which have been declining since the 60's. When asked recently by Hunter Boylan (1985) about the acceptability of admitting underprepared students, Linda M. Combs, Deputy Under Secretary for Management (U.S. Department of Education, Washington, D.C.) expressed sympathy for those institutions confronted with high school graduates underprepared for college coursework and encouraged continuation of successful programs designed to assist those students.

It appears then that admittance of underprepared students will continue. Colleges and universities, therefore, must make specific plans to ensure students success, i.e., "...to provide basic education...in such a way that students reach their intended goals."

Two major movements in higher education demonstrate that this issue is being addressed. First there has been a movement, particularly in community colleges, to require assessment of all in-coming students and to place them according to the results of testing. Many colleges have, at the same time, specified continuation of a non-exclusionary academic floor. Simultaneously, basic skill prerequisites for most college level courses have been or will be established at numerous institutions. Several community colleges in California, for example, have recently implemented basic skills prerequisite systems to control enrollment in college level coursework.

The second and related movement is to assume responsibility for effectively assisting underprepared students. In *Missions of the College Curriculum* (1977), the Carnegie Foundation for the Advancement of Teaching asserted that colleges are obligated to give students any support they can to help them succeed in meeting educational goals. It is stated, however, that colleges should not be expected to accept permanent responsibility for overcoming vast deficiencies resulting from systematic inadequacies of the elementary and/or secondary schools.

The most popular means for providing students the assistance they need has been the establishment of learning improvement programs. As Magarell (1981) points out, "Learning improvement programs have been the mainstay of higher education's response to its changing and underprepared student clientele. Remedial/developmental programs continue to be established in colleges and universities at a faster rate than any other type of course" (p. 1). Roueche, Baker, and Roueche (1984) report that the majority of respondents

to their survey intend to increase their efforts in the future to develop procedures, curriculum, and instruction for underprepared students.

Because learning improvement programs will likely grow in number, it is important to identify the characteristics shared by those reporting high success rates. In summarizing recent research on developmental education, Keimig (1983) reports that, in general, successful programs offer comprehensive services, emphasizing the individual in a positive, person-centered environment that fosters self-confidence. These programs are also integrated into the academic and social mainstream of the college.

Within this framework, special features associated with successful programs can be isolated. Consider the usual categories of program decisions related to elements pertinent to learning outcomes. Such categories include objectives; program structure, including instructional methods and content; organization of program within the college setting and staff; evaluation; and institutional commitment.

In terms of objectives, Keimig (1983) commends the goals of the highest level programs of comprehensive learning systems. Comprehensive goals include all students, all learning encompassed by the course, and relevant staff and pragmatic outcomes for both the developmental and regular programs. Developmental goals must be linked to the college's mission statement. Committees need to negotiate the developmental concept into the goals of other programs. All students need be accepted nonjudgmentally with positive expectations. On a more basic level, Roueche et al. (1984) suggest that the key objective of developmental work is the preparation of students to achieve specific curricular goals.

To expedite student preparation, careful consideration must be given to program structure. Keimig (1983) suggests that program structure outweighs all other variables. She contends that the developmental program should serve as a catalyst in leading the institution to the reaffirmation of its teaching mission. The structure, therefore, should enable developmental educators to influence other college programs.

While Keimig's viewpoint may represent the ideal, it may serve as the foundation on which future programs are built. Currently, however, her recommendation has not been fully implemented in most institutions. Some learning improvement programs, however, have reported commendable success rates. The organization of instruction in those programs for the delivery of basic skills need be examined, especially when program enrollments consist of large groups of extremely underprepared students.

Flexibility is an important program component. Berquist, Gould, and Greenberg (1981), in *Designing Undergraduate Education*, indi-

cate that some institutions are no longer bound to the eight-to-five instructional day, nor to the standard semester or quarter term in which students may take three to five courses. They stress that some students are best served through flexible schedules or courses.

In addition to flexible scheduling, Roueche and Snow (1977) found strong evidence in support of the content-oriented model for developmental programs. Described by Berquist et al. (1981), the content-based instructional model clearly specifies learning objectives, identifies equitable means of evaluating student achievement, uses instructional methods that increase student interest in content, and incorporates individualization of instruction to accommodate different learning styles and other differences.

Cross (1976) shares several program characteristics related to student success: clear goals for students; evaluation through frequent testing; self-paced learning; active, not passive, students; and concise modules. Later, Cross (1979) stresses the need for students to assume more responsibility for their own learning. Renner (1979) indicates that mastery learning and individualized methods cause students to assume responsibility for achieving goals in a flexible schedule. Sequencing instruction from concepts more easily understood to those more complex, a practice which is integral to the mastery learning approach and individualized instruction, is associated with successful programs (Roueche and Snow, 1977). Keimig (1983) supports the eclectic approach with some in-class time balanced with out-of-class drill and instruction. Perhaps she would recommend that out-of-class instruction be organized like that described by Cross (1976) and Berquist et al. (1981).

The affective domain and student habits also deserve attention in instructional programs. According to the New York State Education Department (1977), students' success in college can be predicted from a checklist of behaviors and attitudes such as motivation, timely completion of assignments and projects, and an orientation toward goals. Failure, conversely, might be predicted from the opposite behaviors and attitudes. Successful learning improvement programs nurture development of success-oriented behaviors.

With regard to the organization of a program within the college setting, a third category to consider, evidence suggests that establishing a separate department or division of developmental studies is most effective (Grant and Hoeber, 1978). A division or department is characterized by its own administrative leader who plans, coordinates, budgets, and allocates funds. Roueche and Snow (1977) indicate that departmental or division status facilitates systematic colleg-ewide assessment of needs, program development, and attainment of visibility necessary for innovation and change. In

their view, fragmented courses scattered throughout various divisions cannot compete with programs comprised of regular faculty members working within a division, although in cooperation with counselors and faculty in other areas. Keimig (1983) indicates that developmental programs organized as a department or division accounted for 67% of the successful college programs in one study. She adds that the perception of developmental programs is dependent on their status, and that perception improves with departmental status, which offers a program the opportunity to play a vital role in academic decision-making rather than an ancillary one.

With analyzing staff composition within successful programs, differentiated patterns often emerge. Usually involved are various combinations of full- and part-time faculty, classified assistants and secretaries, teaching assistants and tutors; regular faculty may also play a role in the program. As can be expected, the number and combination of staff members vary depending on institutional philosophy and need. Despite the variation, staff quality is a key to the ultimate success of a program; consequently, staff members must be selected carefully.

A fourth category of program decisions is evaluation. In general, all major features usually associated with the success rate must be evaluated. According to Keimig (1983) the scope of evaluation must be broad; all decision makers should have accurate information about the effects of all controllable variables including students' behavior, developmental and regular program practices, and institutional policies. She recommends that comprehensive evaluation be conducted on an on-going basis to include analysis of long-term effects.

Perhaps less comprehensive, but focusing on key factors involved in today's typical developmental programs are the elements recommended by Roueche et al. (1984) for evaluation: students progress and retention within developmental programs; student satisfaction with program practices; and student retention in college courses taken later. They lament the sparse data currently available for the latter two elements.

At any rate, it is obviously important to evaluate progress and retention, in both developmental programs and in courses taken by the same students later. It also seems imperative to collect and analyze data beyond usual parameters, to base recommendations on analysis of data, and to report results if support is to be enhanced.

Finally, consideration must be given to a fifth category of program decisions: institutional commitment. Such commitment may be reflected in various ways, including maintaining academic standards; allowing performance, not time, to determine progress; and establishing credit-granting policies. When standards are maintained,

minimum acceptable competencies for most objectives are specified for courses. Prerequisite entry-level skills are published to guide the placement of students, and any prior or concurrent remediation deemed necessary is required. Students, although underprepared upon entrance, are clearly expected to reach competency levels. Altering standards is simply patronizing students, and doing so implies deeming them incapable (Gordon, 1975).

Commitment may also be reflected when performance, rather than time in the program, is allowed to determine a student's rate of progress. Typical descriptions of program sequences and time frames are inappropriate and should be eliminated (Roueche, 1981-82).

A third factor which points to commitment for learning programs is the granting of credit. Allowing credit for developmental courses serves as a statement of program support. Roueche et al. (1984) report that institutional credit is given for basic skills courses at most institutions. Cross (1977) detects an upward trend in the award of credit for remedial courses between 1970 and 1974, and Levine (1978) reports that most community colleges offer credit for basic skills courses although only half of the four-year colleges and universities do so.

In conclusion, in order to provide the basic education required for life-long learning and occupational success in an ever-changing marketplace in such a way that students reach their intended goals, colleges are reassessing general education, major requirements, exit competency levels, and course content, sequence, and quality. Furthermore, careful assessment and placement practices are being implemented, and basic skills prerequisites are being set for college level courses. To correct the problem of attrition, positively correlated with underpreparedness, and to provide higher education to as many as possible, institutions have implemented learning improvement programs, which can be considered in terms of program objectives and structure, organization within the college setting, evaluation, and institutional commitment. Given the features reported by outstanding programs, success should be enhanced. Given an interrelationship between learning improvement and regular programs, further success can be expected. Given appropriate assessment and placement of students and the collaboration of all divisions in assisting students, standards of excellence certainly can be achieved.

REFERENCES

Berquist, W. H., Gould, R. A., & Greenberg, E. M. (1981). *Designing undergraduate education: A systematic guide.* San Francisco: Jossey-Bass.

Carnegie Foundation for the Advancement of Teaching. (1970). *Missions of the college curriculum: A contemporary review with suggestions.* San Francisco: Jossey-Bass.

Combs, L., & Boylan, H. (1985). The federal viewpoint: A recent discussion. *Journal of Developmental Education, 9,* (1), 16-18.

Cross, K. P. (1976). *Accent on learning: Improving instruction and reshaping the curriculum.* San Francisco: Jossey-Bass.

Cross, K. P. (1979). *Looking ahead: Spotlight on the learner.* Paper presented at the National Conference for Developmental Education, Lexington, KY.

Gordon, E. W. (1975). *Opportunity programs for the disadvantaged in higher education* (AAHE-ERIC/Higher Education Research Report No. 6). Washington, D.C.: American Assocation for Higher Education.

Grant, M. K., & Hoeber, D. R. (1978). *Basic skills programs: Are they working?* (AAHE-ERIC/Higher Education Research Report No. 1). Washington, D.C.: American Association for Higher Education.

Keimig, R. T. (1983). *Raising academic standards: A guide to learning improvement* (ASHE-ERIC/Higher Education Report No. 4). Washington, D.C.: Association for the Study of Higher Education.

Levine, A. (1978). *Handbook on undergraduate curriculum.* San Francisco: Jossey-Bass.

Magarell, J. (1980, March). Use texts of students to judge performance of colleges, ex-education commissioner urges. *Chronicle of Higher Education, 22,* 8.

New York State Education Department. (1977). *Developmental studies for occupational students: Postsecondary programs.* Albany: New York State Education Department.

Noel, L. (1978). First step in starting a campus retention program. In L. Noel (Ed.), *Reducing the dropout rate.* San Francisco: Jossey-Bass.

Renner, S. M. (1979). College reading programs: What is success? In C. Pinette & K. Smith (Eds.), *College reading skills.* Newark, DE: International Reading Association.

Roueche, J. E., Baker, G. A., & Roueche, S. D. (1984). *College responses to low-achieving students: A national study.* Orlando, FL: HBJ Media Systems.

Roueche, J. E. (1981-82). Don't close the door. *Community and Junior College Journal*, 52, 17-23.
Roueche, J. E., & Snow J. (1977). *Overcoming learning problems.* San Francisco: Jossey-Bass.

SELF-EFFICACY AND READING ACHIEVEMENT

David D. Marsh
Universtiy of Southern California
Diane M. Penn
El Camino College

What determines whether or not community college developmental reading students will improve? Is it primarily the quality of the instruction they receive? How important are teacher characteristics to student success or failure? What role do student-related factors, such as effort and interest, play in determining how well they fare in academic classwork? And finally, do developmental reading students have additional needs and problems which impact chances for success?

The authors believe that these issues can best be interpreted within the conceptual framework of Bandura's (1982) *self-efficacy* theory. This theory links achievement to personal mastery expectations, thereby linking learning behavior to related motivational contingencies. When applied to the remedial reader, self-efficacy theory clarifies the circumstances under which optimal learning can occur. It suggests ways students, who have typically experienced repeated school failure, can profit from instruction.

In order to optimize the learner's chances for achievement, efficacy expectations must be carefully evaluated. Does the learner believe he or she can succeed? How does the learner feel about his or her adequacy as a learner? How strong or weak is learner self-concept? Subsequent to such assessment, efficacy-enhancing, supportive instruction must be designed.

Both investigators' professional experience and the literature attest to the fragile, often negative, self-concepts of adult remedial readers (Ahrendt, 1975; Aikman, 1984; Knowles, 1970; Purkey, 1970; Quandt, 1972). Students' *self-concept of ability* has been shown to have an even stronger relation to academic achievement than their more global self-concepts (Brookover, 1969; Hansford & Hattie, 1982; West, Fish, & Stevens, 1980). There is additional evidence that students' evaluations of their capabilities affect learning behavior. Schunk (1984) pinpointed *self-efficacy*—"personal judgments of one's capability to organize and implement behaviors"—as a crucial variable in understanding achievement behavior (p. 48). He suggested that

students would avoid tasks for which they hold a low sense of efficacy, but would eagerly participate in those they feel more efficacious. Brown and Inouye (1978) also posited that, when students face obstacles, a high sense of efficacy will motivate them to work harder and persist longer than they would if they doubt their capabilities. Bandura (1982) isolated self-efficacy as the key component in his or her theory of motivation and hypothesized that it affects effort expenditure and task persistence.

According to self-efficacy theory, given adequate incentives and skills, students' personal mastery expectations are more potent predictors of behavior than either outcome expectancies or traditional behavior incentives. Self-efficacy theorists hold that there are four major sources of efficacy expectations: performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. This study verifies the importance of each of these sources of efficacy expectations for changing reading behavior. Additionally, the study demonstrates that heightening a college reading student's sense of efficacy leads to an improvement in his or her reading performance.

Research Questions

This paper focuses on several questions which were included in an extensive, year-long study examining the relative intensity of community college reading students' concerns regarding a developmental reading course, English RB (Penn, 1985). For purposes of the present review, four of the major research questions posed were addressed:

1. To what extent will lack of self-efficacy emerge as a major personal concern of the community college reading student?
2. How do community college reading students' personal concerns regarding issues of adequacy (efficacy expectations) change over time?
3. What are community college reading students' perceptions of factors that influence changes in efficacy expectations (as reflected in decreased personal concerns)?
4. What is the relationship of personal concerns (efficacy expectations) to reading gains?

Data Source

Ninety developmental reading students enrolled in El Camino Community College Reading Department course, English RB, during spring semester 1985 served as sample for this study.

The English RB Program

The three major goals of the English RB program included: (1) improving students' literal and critical comprehension skills; (2) building vocabulary; (3) improving rate of reading comprehension and developing ability to read flexibly by adjusting rate of reading to difficulty, purpose, and type of material.

All students enrolled in English RB attended two, two-hour sessions per week over an 18-week semester. Students developed their comprehension skills by practicing in class group work the multi-step reading process, summarized in the Appendix. They were also required to practice this reading process at home, individually, for 20 minutes daily. Additionally, RB students participated in vocabulary-building exercises, conducted in small group setting, which were designed to increase knowledge of basic Latin and Greek roots, prefixes, and suffixes. Finally, rate and flexibility were developed through timed-reading sessions and completion of reading workbook perception exercises.

Because college reading students typically suffer from a low sense of self-efficacy, the instructor continually strove to build students' self-confidence. The setting of hierarchically sequenced, proximal objectives for each of the three major goal areas—comprehension, vocabulary, and reading rate—was basic to this effort. These objectives allowed students to continuously experience success, and thereby, helped build positive self-concepts (Baumann, 1984; Quandt, 1972; Schunk, 1984). The instructor gave students frequent positive verbal reinforcement. Individual student progress charts served as further reinforcement of reading gains.

In addition to setting realistic objectives and reinforcing success, the instructor addressed students' efficacy expectations by discussing common causes of reading deficiencies including:

1. Constant television viewing (Liberman, 1983).
2. Elementary school instructional programs which focus on word decoding at the expense of comprehension skill development (Hoffman & Rutherford, 1984; La Berge & Samuels, 1974).
3. Lack of student effort expenditure (versus lack of ability).

The instructor also attempted to heighten RB students' efficacy expectations by informing them that many of their peers (approximately 30% of El Camino students) had taken reading courses and significantly improved their reading skills.

Throughout the semester, the instructor encouraged open expression of student feelings on reading-related concerns that reflected inefficaciousness. Student opinions and reactions were continuously

solicited. The instructor strove to communicate genuine, warm feelings of caring and support for students as well as empathy for their frustrations.

Methodology

A written questionnaire, adapted from the University of Texas Research and Development Center's Stages of Concern Questionnaire of teachers implementing innovations (Hall, George, & Rutherford, 1979), was devised to determine the relative intensity of reading students concerns regarding English RB. Seven areas of concern were examined including personal concerns—uncertainties about an individual's adequacy to meet course demands, i.e., the student's efficacy expectations. Also, an open-ended statement of concern was solicited by the stimulus: "When you think of this English RB course, what are you concerned about?" to determine the specific content of students' concerns. Both the questionnaire and the open-ended statement were administered three times over the course of the semester. Additionally, interviews were conducted with RB students at the end of the semester to explore their perceptions of factors responsible for changes in concerns. Finally, the Nelson-Denny Reading Test was administered at the beginning and end of the semester to determine reading gains.

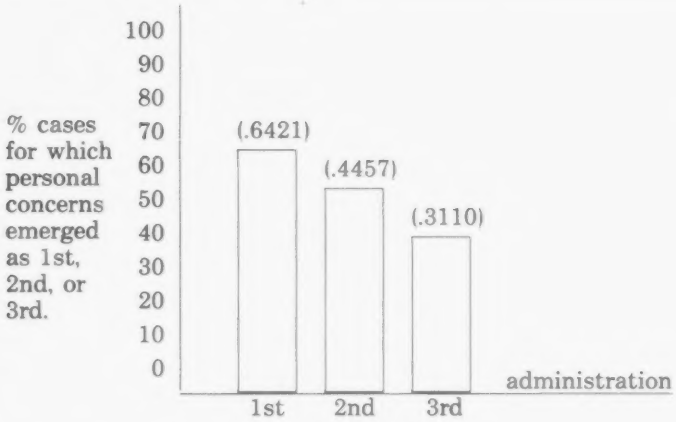
Results

The first research question asked to what extent self-efficacy emerged as a major personal concern of the college reading student; the student research question addressed the manner in which such concerns changed over the course of the 18-week semester. Table 1 reveals that self-efficacy-related concerns were prevalent among English RB students. It also depicts the rate at which the concerns decreased through the semester.

Open-ended statements of concern corroborated that developmental reading students suffered from feelings of inadequacy regarding their ability to succeed in English RB. Interview data confirmed questionnaire and open-ended statement responses.

Table 1

Emergence of Efficacy-Related personal Concerns as First, Second, or Third in Intensity across Three Questionnaire Administrations.



The third research question addressed student perceptions of factors that influenced changes in their efficacy expectations (as reflected in decreased personal concerns). Interview responses fell into four categories:

1. Instructional strategies—including both content and method-related aspects of instruction.
2. Student-related factors—including ability, effort, and interest.
3. Teacher characteristics—including perceived openness, warmth, and enthusiasm.
4. Instructional materials—including reading laboratory facilities and course textbooks.

Within category one, *instructional strategies*, eight different aspects of the instructional program were mentioned as having improved reading skills and, concommitantly, heightened efficacy expectations:

1. Practicing the multi-step reading process (Appendix).
2. Completion of perception exercises.
3. Small group vocabulary sessions.
4. Large group and individualized timed reading sessions.

5. Breaking the megaskill of reading down into subskills, and setting hierarchically sequenced, proximal objectives for each of these subskills.

6. Positive feedback/reinforcement from instructor and individual progress charts.

7. Discussion of reasons for reading deficiencies, such as constant television viewing, inadequate elementary school programs, and lack of effort expenditure.

8. Social comparative information given by the instructor that 30% of El Camino College students take reading courses and significantly improve their reading skills.

Within the second category, *student-related factors*, effort expenditure and increased interest were the primary dynamics mentioned as responsible for improved reading and accompanying heightened efficacy expectations.

Teacher characteristics comprised the third cluster of factors which student interviewees cited as accounting for decreased personal concerns. RB Students reported that it was the teacher's ability/inclination to address their reading deficiency-related frustrations that made her so effective. Such frustrations were reportedly relieved by the instructor in two ways. First, she encouraged open-expression of frustrations, thus legitimizing such verbalization. Second, she communicated the acceptance of poor readers as valued persons and conveyed warm feelings of caring and respect.

Instructional materials was the final category of factors which students perceived as responsible for decreased personal concerns. Interviewees reported that course textbooks and reading lab kits helped to improve their reading skills, and thus enhanced their efficacy expectations.

Implications

Since self-defeating efficacy expectations are so prevalent among the community college reading student population, developmental reading teachers must be sure to attend discriminately to students' self-perceptions. They must help students to perceive themselves as more adequate learners. This can be accomplished only if teachers *listen* and develop sensitivity to the specific nature of students' concerns. Teachers must strive to build a classroom environment that encourages open communication and trust between teachers and students. They need to let students know that they are aware of their needs and are interested in each of them as unique persons. Teachers must stop thinking of students as synonymous with learning outcomes and begin treating them as people, characteristically tentative

in their academic self-concepts, who are being asked to change. Finally, college developmental reading teachers must provide an educational atmosphere of success in order to help students develop more positive images of themselves as learners.

REFERENCES

Ahrendt, K.M. (1975). *Community college reading programs.* Newark, DE: International Reading Association.

Aikman, C.C. (1984). The adult student: Challenge and response. *Western College Reading and Learning Association Journal, 3*(2), 3-5.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Bandura, A. (1982). Self-efficacy mechanism in human agency. *American Psychologist, 37,* 122-147.

Bandura, A., & Schunk, D.H. (1981). Cultivating competence, self-efficacy, and intrinsic interest through proximal self-motivation. *Journal of Personality and Social Psychology, 41*(3), 586-598.

Baumann, J.F. (1984). Implications for reading instruction from the research on teacher and school effectiveness. *Journal of Reading, 28*(2), 109-115.

Brookover, W.B. (1969, February). *Self-concept and achievement.* Paper presented at American Educational Research Association Convention, Los Angeles.

Brown, I., Jr., & Inouye, D.K. (1978). Learned helplessness through modeling: The role of perceived similiarity in competence. *Journal of Personality and Social Psychology, 36*(8), 900-908.

Brown, J.I., & McDowell, E.E. (1979). The role of self-image on reading rate and comprehension achievement. *Reading Improvement, 16,* 22-27.

Curtis, A.C. (1982). A study of the effects of process-oriented reading instruction and self-concept enhancement on reading achievement among community college students. *Dissertation Abstracts International, 43,* 2616A.

Drummond, R.J., Pinette, C.A., & Smith, R.K. (1977). Examining the effects of self-concept and work values on reading achievement. *Reading World, 16,* 206-212.

Hall, G.E., George, A., & Rutherford, W.L. (1979). *Measuring stages of concern about the innovation: A manual for use of the SoC questionnaire.* Austin: Research and Development Center for Teacher Education, The University of Texas.

Hansford, B.C., & Hattie, J.A. (1982). The relationship between self and achievement/performance measures. *Review of Educational Research, 52*(1), 123-142.

Hoffman, J.V., & Rutherford, W.L. (1984). Effective reading programs: A critical review of earlier studies. *Reading Research Quarterly, 20*(1), 79-92.

Klimes, A.H. (1977). Self-concept patterns of inadequate and adequate adult readers. *Dissertation Abstracts International, 38*, 3383A-3384A.

Knowles, M. (1970). *The modern practice of adult education.* New York: Association Press.

LaBerge, D., & Samuels, S.J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 6*, 293-323.

Liberman, M. (1983). The verbal language of television. *Journal of Reading, 26*(7), 602-609.

Lund, P.A., & Ivanoff, J.M. (1974). Correspondence of self-concept measures with levels of reading achievement. *Journal of Reading Behavior, 6*, 159-165.

Mangieri, J.N., & Olsen, H.D. (1976). Self-concept of academic ability and reading proficiency. *Reading Horizons, 17*, 28-34.

Penn, D.M. (1985). The concerns of community college reading students regarding college development reading programs. *Dissertation Abstracts International* (in press).

Purkey, W.W. (1970). *Self-concept and school achievement.* Englewood Cliffs, NJ: Prentice-Hall.

Quandt, I. (1972). *Self-concept and reading.* Newark, DE: International Reading Association.

Rotter, J.B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological Monographs, 80* (1, Whole No. 609).

Schunk, D.H. (1984). Self-efficacy perspective on achievement behavior. *Educational Psychologist, 19*(1), 48-58.

Weiner, B. (1979). A theory of motivation for some classroom experiences. *Journal of Educational Psychology, 71*, 3-25.

West, C.K., Fish, J.A., & Stevens, R.J. (1980). General self-concept of academic ability and school achievement: Implications for "causes" of self-concept. *The Australian Journal of Education, 24*(2), 194-213.

APPENDIX

A SYSTEM FOR READING EFFECTIVELY

I. *Before Reading:*	
a. Survey	Preview titles, headings, subheadings, topic sentences of paragraphs, summaries, questions, new vocabulary. Examine pictures, diagrams, maps, charts, tables, graphs.
b. Question	As you survey, generate questions to establish purpose and formulate organizing framework for text. What does a title mean? What does a visual aid have to do with a chapter?
c. Hypothesize	Speculate as to the answers of the questions you have formulated. *Think aloud* how ideas are interrelated.
II. *During Reading:*	Associate ideas, search for unifying threads, identify key concepts, image, draw analogies, summarize, paraphrase, evaluate text. Find answers to your questions and generate new ones as your understanding grows. Read to confirm or negate hypotheses formulated.
III. *After Reading:*	Check your comprehension in any one of a number of ways including: reciting to yourself, taking notes, writing summaries, answering comprehension questions, discussing material with someone else.

DEVELOPMENTAL WRITING COURSES: A VEHICLE FOR TEACHING WRITING ACROSS THE DISCIPLINES

Rose Austin
North Harris County College, East

Developmental writing courses of some type are prevalent on most college campuses. Certainly, the chief objective of such courses is to build students' basic writing skills so that they can successfully complete content courses. Thus, enhancing writing performance across the disciplines is an essential ingredient in a successful developmental program.

Improvement in writing skills can often result in better performance in content courses. However, many content instructors are reluctant to spend class time developing and reinforcing writing skills for fear that this endeavor will substantially reduce content instruction time. These instructors cannot perceive a middle ground of incorporating writing skills into subject matter. Nevertheless, content instructors expect their students to write well. This frequent, yet conflicting, attitude of content instructors makes the concept of writing across the disciplines more difficult to implement; however, conscientious developmental writing instructors can incorporate content from various disciplines into developmental writing courses. Thus, developmental writing courses can become vehicles for teaching writing across the disciplines.

Background

When the concept of writing across the disciplines first emerged, many content instructors interpreted this concept to mean the teaching of grammar in their courses. With this misinterpretation, it is no wonder that many threw up their hands in despair, for many did not feel overly competent in their knowledge of correctly written grammatical principles or in their ability to teach them. In many instances, the teaching of these now *new* skills did cost instructors valuable instruction time. And in so doing, they missed the point.

The concept of writing across the disciplines suggests that writing should be done in all content areas, for students understand content better when they write about it. Writing is seen as providing

and encouraging orderly thinking and language processing. Writing is not seen as knowledge of grammar (although grammar is a component of writing), nor is writing an end product; writing is an active process whereby one personalizes knowledge and achieves lasting learning (Knoblauch & Brannon, 1983; Shuman, 1984).

Learning the Writing Requirements of Other Disciplines

To successfully use developmental writing classes to teach writing across-the-disciplines, it is first necessary for developmental writing instructors to familiarize themselves with the content of other disciplines, and more specifically, with the writing requirements of those disciplines. Often, the study skills/learning lab houses desk copies of the college's currently-adopted textbooks for lab staff's use in content tutoring; these texts are accessible to developmental writing instructors. By perusing these texts, developmental writing instructors can detect possible content writing assignments. Acquiring a copy of content instructors' syllabi is a second way for developmental writing instructors to become familiar with content and writing requirements of other disciplines. Copies of these syllabi may also be located in the study skills/learning lab. Developmental writing instructors may use a third method for assessing content writing requirements by conducting surveys which determine what types of writing are required college-wide. Such surveys may additionally seek qualities that content instructors value in student writing or seek major problems in student writing.

Teaching Writing Across the Disciplines in the Developmental Writing Class

By using the results of college-wide surveys, developmental writing instructors have a basis for focusing content instruction within a developmental writing framework. Even though all of the writing assignments required in content courses (essay, journals, book reports, etc.) cannot be incorporated into developmental instruction, many can be. Most likely, the qualities content instructors value most in student writing (clarity of topic sentence, sentence structure, mechanics, etc.) and the problems most detected in student writing (lack of clarity of topic sentences, poor sentence structure, etc.) are skills normally covered in developmental writing classes; therefore, developmental writing instructors may wish to concentrate on incorporating these skills into those content writing assignments applicable for developmental classes.

Listed below are content writing activities that fit smoothly into developmental writing courses:

1. *Essays and themes.* As most developmental writing instructors require their students to write essays and themes, it will not be difficult to focus these writing assignments on rhetorical modes appropriate for content classes. For example, developmental writing instructors may encourage students to write a comparison/contrast essay on two historical periods they are currently studying rather than allowing students to compare/contrast high school and college.

2. *Journals.* Journal writing provides the most flexibility in topics. By requiring students to write two or three weekly entries in journals, developmental writing instructors will see content from various disciplines. Instructors should note, however, that journal writing is most effective when students receive no punitive grading.

3. *Reports.* Developmental writing instructors may allow their students to use content assignments to satisfy developmental writing requirements. Thus, students may use developmental class time to prepare content work. Developmental writing instructors discuss errors in students' papers in the same manner as they do with developmental writing assignments.

4. *Letters.* As many developmental classes include returning students, developmental writing instructors may focus writing assignments on everyday problems and issues. Students may be required to write letters of complaint, employment, credit adjustments, etc.

5. *Publications.* Students enrolled in developmental writing classes may publish works in a developmental studies newspaper or newsletter. Such a privilege can inspire students to write on a multitude of topics.

Conclusion

Even if some content instructors are reluctant to include writing assignments in their coures, writing activities across the disciplines can be emphasized within developmental writing classes. By polling content instructors concerning their writing requirements, developmental writing instructors can incorporate much of this content into their instruction.

REFERENCES

Knoblauch, C.H., & Brannon, L.(1983). Writing as learning through the curriculum. *College English, 45,* 465.

Shuman, R. (1984). School-wide writing instruction. *English Journal, 73,* 54-57.

READING STUDENTS' INVISIBLE TEXTS: EVALUATING WRITING PROCESSES

Barbara Tomlinson
Peter Mortensen
University of California, San Diego

Sometimes the errors and problems visible in students' essays can mislead instructors, inducing them to choose teaching strategies that are ineffective or even harmful. If instructors evaluate only their students' essays, they will overlook a second, and often equally important, "text" that is hidden from view: the "invisible text" of the student's decision-making while writing—the student's writing processes. We discuss here several kinds of visible problems which might be misleading without knowledge of the student's writing processes, and suggest how instructors can learn to read for students' invisible texts.

Misleading Visible Problems

Divergent Verbal and Written Performance

An instructor may have students in composition classes or tutoring sessions who seem to be bright, articulate, and interesting. Then, when time comes for the first in-class essay, she may receive writing like this:

> The reader is told that a law defining porno as "the graphically, sexually explicit subordination of women" The author a bit of shock effect in listing some of the thing which governed by this and these are very repusive. In this the reader is given to associate the word pornography with this reputation.

How could such an articulate student write something like this? Was his instructor totally misled? No, not necessarily. If she had overheard "Evan," the writer of this passage, reading aloud as he wrote, his in

flection indicating correct punctuation, she would find that he reads things that he has not in fact written: in fact, what he reads is much like this:

> The reader is told about [*that*] a law defining porno as "The graphic[*ally*], sexually explicit subordination of women .[ ]" The author *uses* a bit of shock effect in listing some of the things which *are* governed by this *law*, and these *things* are very repul*s*ive. In this *way* the reader is given to associate the word pornography with this repul*s*ion.
>
> *Underlining indicates text added during reading; underlining in brackets indicates text deleted.*

What Evan has said—and thinks he has written—is not error-free, but is certainly comprehensible and even analytic. However, he is unable to transcribe a coherence that is evident in his classroom participation and present in his thoughts while writing. And, though it is not evident in this quotation, he is equally unable to write consistently the type of analytic comments he makes in class.

If instructors are unaware of how writers create passages like the first one above, if they do not attempt to find out what this student *thought* he was saying or doing, they are likely to be misled about the best ways for him to improve his writing. For example, an instructor might think that Evan's problems are almost insoluable, that she must retreat to working with him on the most fundamental ways of conceptualizing and expressing ideas. But since his oral sentences are generally correct, she knows that she can take advantage of that to improve Evan's written sentences—for instance, by making him read each sentence aloud very carefully to the instructor or to another student, adding every word he *meant* to include in his text. She also knows that Evan's surface errors, omissions, and fragmentation obscure his actual ability to express analytic thought; she need not wait for the development of basic sentence coherence to start to address his problems of analysis and overall organization.

Overlooking Grammatical Errors

An instructor could be misled in another case, that of "Ken," because of the presence of grammatical errors in his paper. Ken appears to have been careless in correcting comma splices, exactly the

same kind of comma splices that his instructor had pointed out and labeled on a previous paper. For instance, the following is from his most recent essay:

> There were many cases of malnutrition at that time, food is always scarce near the front lines. Soldiers often have lots of problems like this in the First World War, in the Korean War, and in the war in Vietnam, and in other places where there is combat.

The presence of the comma splice between "time" and "food" above suggests that Ken did not make a serious attempt to correct his errors. What the text does not reveal is that ken had done *just* what his instructor had suggested: he had looked up and read about "Comma Splice Errors" in his grammar handbook, and he had tried to find "candidates" for repair in his rough draft. But he had had considerable difficulty comprehending the handbook's condensed description, with its references to "independent clauses," "conjunctive adverbs," and "subordinating conjunctions." After working on the essay for almost one hour, he produced the following revision:

> There were many cases of malnutrition at that time, food is always scarce near the front lines. Soldiers often have lots of problems like this in the First World War; in the Korean War; in the war in Vietnam; and in other places where there is combat.

Ken, aware that he had not seen sentences like this in his reading, but unable to figure out what else to do, removed the new semicolons, and turned in an essay that suggested—misleadingly—that he was careless about punctuation.

Reducing Risks

Essays can also be misleading if students eliminate from them evidence of sophisticated but risky rhetorical strategies. "Lori," for example, turned in an essay composed of short, rather choppy sentences like these:

> Capital punishment is useless. Criminals are not deterred by it. Franklin discredits the studies that argue for it on this basis. There are as many murders after as before an execution.

An instructor who knows nothing about Lori's writing process might well ask her to complete a series of sentence-combining exercises, since these have been shown to encourage students to write more complex sentences. However, the instructor would have come to a much different conclusion if the same passage from Lori's first draft were available:

> Capital punishment is useless because criminals are not deterred by it, because if they were, Franklin argues that there should be fewer murders after an execution than there are before, which there aren't.

It seems that Lori first wrote her essay in sentences that were often long and complex, effectively indicating patterns of coordination and subordination among her ideas. But to avoid being criticized for long sentences, errors in punctuation, and the like, Lori reduced her complex sentences to simple sentences in the final draft.

As these cases demonstrate, instructors sometimes need to go beyond the visible information of the essay: when students' ideas in class are better than in their essays, when students' texts are incoherent, when students continue to have the same problems over and over, or whenever instructors have trouble "diagnosing" students' problems. To plan teaching strategies to address these problems, instructors cannot rely solely on what students write; they also need to know *how the writing got that way*. Where instructors look—at product or performance—profoundly affects what and how they will teach.

Reading Invisible Texts

Various methods of close observation have provided researchers with a good deal of information about students' writing processes. However, most of these methods require one to collect and analyze much detailed data. Clearly, gathering information in such detail can be a complex matter—a task that might well interfere with actually helping students solve their writing problems. Here are several rough-and-ready ways to supplement information from students' essays and thereby to learn about students' writing processes.

Composing Aloud

One method for close observation involves having students compose aloud while the instructor or tutor listens (if necessary, the student could bring in a tape of an at-home composing session). Students should sit down with the assignment and try to speak aloud all the

thoughts that are going through their heads as they write. The instructor may leave the room or, if she remains, may sit behind the student in order to make notes without being seen. If the student stops talking, he or she should be encouraged by a quiet reminder, such as "keep talking," or "what are you thinking now?"

The instructor should make notes that capture the decision-making that leads eventually to what appears in the text. For instance, often students interpret an assignment in idiosyncratic ways; the problems of an essay may stem directly from the interpretation. Students may define terms in unexpected ways; they may make inappropriate assumptions about what the instructor wants or what the final essay should be like; they may choose a strategy that spells failure from the start. As students begin to write, their composing aloud reveals the "logic" of their writing processes, as well as other important factors that might be concealed by the visible text. Instructors will be able to see problems like premature editing, excessive self-criticism, or the use of rigid rules. It was by using this technique that the instructor discovered Evan's actual mastery of basic sentence structure.

Keeping a Writing Log

Another method to get information about writing processes is to have students keep "writing process logs" that they turn in with their essays. In asking students to keep such a log, instructors can explain that the purpose of the log is to help both student and instructor understand what happens as the student writes. Students should keep notes on their writing activities but not let the note-taking interfere with writing a good essay. (Usually one doesn't grade the behaviors described in the log, rather the concern is only whether the log has been kept.)

A log like this might consist of notations about what strategies students followed in completing their essays, what strategies they considered but decided against (and why), how long various writing tasks took them, and so on. Ken's log, for example, might read:

1:00-5:30	Wrote paper in library from note plans. Got stuck for about an hour on what evidence to use.
7:00-7:50	Looked up comma splice rules. Looked for problem sentences.

10:30-11:15 Wrote conclusion by summarizing topic sentences.
12:00-2:15 Typed paper, checking spelling.

Such a log can help the instructor understand what students *think they are doing* as they write; she may subsequently use it as the basis for a series of questions and comments about their writing strategies. In Ken's case, an instructor could talk about time—redistributing the same amount of writing time to allow him to get some distance on his evolving draft. She could suggest that Ken "break" his afternoon writing block by discussing his paper with a friend. She could talk about an alternative to the strategy Ken used to write his conclusion. Or, as mentioned earlier, she could review his procedure for detecting comma splices and establishing a "rule of thumb" for him to use in identifying candidates for correction.

Comparing Drafts

A third method for understanding how students write is, of course, to compare their rough drafts to their final drafts. It is not unusual for writing teachers and counselors to ask to see students' rough drafts. This is because rough drafts are invaluable records of students' struggles to meet the assignment. But merely to gather in rough drafts to observe the changes is much less effective than asking students to give a "guided tour" of major changes between drafts, explaining their methods and motives for revision. In giving such a tour, Lori would reveal the foci of her attention during revision, the "rules" she operated by, and other factors that influenced her, such as her fear of taking risks with complicated sentence structures.

Conclusion

The speaking-aloud procedure described here is a more limited, teaching-oriented version of a research technique known as "protocol analysis," a technique which has been used particularly by Linda Flower and John R. Hayes at Carnegie-Mellon University. For further information on this research technique, see Berkenkotter (1983), Murray (1983), Swarts, Flower, and Hayes (1980), Flower and Hayes (1980). Other studies and case studies that may be relevant and interesting include Emig (1971), Jacobs (1984), Mischel (1974), Newell (1984), Perl (1979, 1980), Pianko (1979), Rose (1980, 1984), Selfe (1984), and Sommers (1980). Information about teaching students to observe and understand their own writing processes, such as when they keep

writing process logs, may be found in Brannon, Knight, and Neverow-Turk (1982), Coe and Gutierrez (1981), Harris (1983), Mohr (1984), and Rubin (1983). Information about research on patterns of revision between drafts may be found in Faigley and Witte (1981); teaching strategies based on revision "habits" may be found in Schwartz (1983).

Using such techniques to obtain information about *how* Evan, Ken, and Lori wrote enabled the instructor to plan strategies to improve *what* they wrote. The extra information—the information about processes—prevented her from being misled, from giving inappropriate advice, from compounding problems rather than solving them. If instructors are not to be deceived again by the visible surface of students' essays, they need to find, to create, to analyze, to "read" evidence of students' writing processes. To understand students' visible texts, an instructor must read what students have written, but also what they have *not* written: the students' "invisible" texts.

REFERENCES

Berkenkotter, C. (1983). Decisions and revisions: The planning strategies of a publishing writer. *College Composition and Communication, 34,* 156-168.

Brannon, L., Knight, M., & Neverow-Turk, V. (1982). *Writers writing.* Montclair, N.J.: Boynton/Cook.

Coe, R.M., & Gutierrez, K. (1981). Using problem-solving procedures and process analysis to help students with writing problems. *College Composition and Communication, 32,* 262-271.

Emig, J. (1971). *The composing process of twelfth graders.* Urbana, Ill.: National Council of Teachers of English.

Faigley, L., & Witte, S. (1981). Analyzing revision. *College Composition and Communication, 32,* 400-414.

Flower, L., & Hayes, J.R. (1980). The cognition of discovery: Defining a rhetorical problem. *College Composition and Communication, 31,* 21-32.

Harris, M. (1983). Modeling: A process method of teaching. *College English, 45,* 74-84.

Jacobs, S. (1984). Composing the in-class essay: A case study of Rudy. *College English, 46,* 34-42.

Mischel, T. (1974). A case study of a twelfth grade writer. *Research in the Teaching of English, 8,* 303-314.

Mohr, M.M. (1984). *Revision: The rhythm of meaning.* Upper Montclair, N.J.: Boynton/Cook.

Murray, D.M. (1983). Responses of a laboratory rat—or, being protocoled. *College Composition and Communication, 34,* 169-172.

Newell, G. (1984). Learning from writing in two content areas: A case study/protocol analysis. *Research in the Teaching of English, 18,* 265-287.

Perl, S. (1980). A look at basic writers in the process of composing. In L. Kasden and D. Hoeber (Eds.), *Basic writing: Essays for teachers, researchers, and administrators.* Urbana, Ill.: National Council of Teachers of English.

Perl, S. (1979). Unskilled writers as composers. *Teachers and Writers Magazine, 11,* 12-17.

Pianko, S. (1979). A description of the composing processes of college freshman writers. *Research in the Teaching of English, 13,* 5-21.

Rose, M. (1980). Rigid rules, inflexible plans, and the stifling of language. *College Composition and Communication, 31,* 389-401.

Rose, M. (1984). *Writer's block: The cognitive dimension.* Carbondale, Ill.: Southern Illinois University Press.

Rubin, L. (1983). Staffroom interchange: Exploration of the writing experience: A way to improve composing. *College Composition and Communication, 34,* 349-355.

Schwartz, M. (1983). Revision profiles: Patterns and implications. *College English, 45,* 549-558.

Selfe, C. (1984). The predrafting processes of four high-and four low-apprehensive writers. *Research in the Teaching of English, 18,* 45-64.

Sommers, N. (1980). Revision strategies of student writers and experienced adult writers. *College Composition and Communication, 31,* 378-388.

Swarts, H., Flower, L.S., & Hayes, R.J. (1980). Designing protocol studies of the writing process: An introduction. Paper presented at the Research on Language Arts Workshop, National Council of Teachers of English Convention.

ADJUNCT COURSEWORK AT SAN JOSE STATE UNIVERSITY

Daniel Sanidad, Mary Ann Sanidad, Norma Spalding
San Jose State University

The Chancellor's Office, in its 1983 report entitled "Promises to Keep," reviewed the remedial programs in the California State University system and recommended that remedial work be offered only for the four per cent of students who are admitted under the "special admit" status. This means that the Reading Assistance Program at San Jose State University and those of the other 18 campuses statewide will be significantly reduced. Remedial work in reading and writing will be the province of the California community college systems.

Underprepared students who were enrolled in the Reading Assistance and Intensive Learning English classes will still be enrolled in the university, but the help they need will have to be delivered in a new way. The University of California and the California State University systems, in joint association in the Learning from Text project under the direction of Harry Singer, have provided a model for adjunct coursework. At its culmination conference at Lake Arrowhead, California, in October, 1984, the following resolution was offered.

Resolution #1

WHEREAS, the UC/CSU Learning From Text Project has developed a database which demonstrates the clear relationship between learning-from-text ability and achievement in the university, and

WHEREAS, the database also supports a clear need for learning-from-text instruction in the university system, and

WHEREAS, the project has demonstrated the value of involving professors, students, and learning center personnel in learning-from-text instruction, and

WHEREAS, specific instructional strategies have been verified through learning-from-text—sponsored controlled research in academic courses, be it therefore

RESOLVED that every UC/CSU student shall be exposed to instruction in how to learn from text.

Implementation

San Jose State University has begun to implement this resolution through adjunct coursework in Biology. The class called EDSE 10 Adjunct Learning: Biology was taught for the first time in spring of 1986. It was offered for one or two units and had 30 students enrolled from three classes in Biology 10. After a thorough evaluation of the Biology adjunct class, coursework will be offered in other disciplines, such as the Administration of Justice, Division of Technology, and Psychology Departments.

Inaugurating coursework of this type requires a commitment of time and energy. During the Fall semester, 1985, the EDSE 10 instructor met with curriculum committees from several university departments, department chairpersons for Biology and Special Education, as well as with the Dean of Undergraduate Studies, who oversees the curricula at SJSU to explain the adjunct concept. Paperwork had to be prepared and passed by departmental and division curriculum committees, the curriculum committees for the School of Education, and the university before the class could be taught. Then the class had to be marketed, which meant the instructor needed to attend several sessions of each of the three classes of Biology to explain the course plans, since the course was approved too late to be included in the university schedule of classes.

Grading

The class met two days each week for one hour. Students who elected to come both days received two units of credit. Students who enrolled for one unit could come either day. Credit-no credit grades were based on performance in the Biology 10 class. Credit was earned if the student received an *A*, *B*, or *C* grade; otherwise no credit was given.

Student Demographics

Biology 10 is a three-unit general education class which attracts students from sophomore to senior levels who do not want to take a lab science course. Thus, it draws liberal arts students who are afraid of the sciences and their demanding requirements, limited-English-speaking students with engineering/computer/mathematics backgrounds, and students who are working 40 hours per week and looking for a science course which does not require the extra time for a three-hour laboratory. These factors have led to a *D* and *F* ratio of 20% in the Biology course. In spring of 1986, 278 students were

enrolled in three classes taught by a single Biology instructor who was particularly interested in reducing the number of failures and low grades. Two other instructors taught one class each and will be included in the adjunct program in 1986-87.

Testing

Working closely together, the adjunct course instructor and the Biology instructor developed a test to measure the students' skill in reading the Biology textbook. It measures speed, vocabulary, comprehension and the ability to follow directions. The 30-minute test was administered during the second session of each class, and all students were required to take it. Students were notified of their scores; it was recommended that students who failed to answer 60% of the comprehension questions, or were unable to define 60% of the vocabulary from context, enroll in the adjunct class. Students who passed the test were allowed to enroll if they wished.

Of the 278 students enrolled in the Biology 10 class, 81 (29%) were recommended for the adjunct class. Of these 81 students, 22 (27%) actually enrolled in it. Eight students whose scores were above 60% (4% of the total not recommended for the adjunct work) also enrolled in the class to make a total of 30 students.

Of the 30 students who enrolled in EDSE 10, 13 were male and 17 were female. There were 2 who declared their ethnic backgrounds to be Hispanic, 12 Asians, 7 Blacks, 7 Caucasians, 1 from the Middle East, and 1 from India. Class levels included 3 freshmen, 10 sophomores, 5 juniors, and 4 seniors. Eight students failed to indicate class level.

Course Content

The adjunct course content included note-taking skills, tips on time management, interpretation of the textbook, cognitive mapping, test preparation, and small group activities. The class texts were the Biology textbook and its accompanying student handbook. The Biology instructor provided study guides for each of the major topics covered in the class. The first two topics were not covered in the textbook, so note-taking and time-management skills were first priority. An adaptation of the Cornell method was used to teach note-taking. Students were required to form small study groups of three or four and to establish regular meeting times and places for review. Cognitive mapping as a means of learning the concepts from the textbook was taught and practiced. As time for the first midterm examination drew near, methods of preparation for objective tests

were taught; sections from the text were reviewed, and language complexities were discussed. The class was scheduled during the Biology instructor's office hours; he also conducted reviews of difficult concepts (open to all students in Biology 10) just prior to each examination.

Faculty Small Grant

On April 4, 1986, the adjunct course instructor was awarded a School of Education faculty small grant to conduct research to evaluate the adjunct coursework. Evaluation includes recording the following: (1) testing of all adjunct class members with the Nelson Denny Form E; (2) a careful record of attendance in class and in small group study; (3) recording of scores in each of the two Biology midterms and the final examination; (4) G.P.A.; and (5) surveys monitoring faculty and student reaction to the adjunct class.

Results

Table 1 shows the grades of all the students enrolled in EDSE 10 and all of the students not enrolled in EDSE 10. A *U* grade is given for an unofficial drop and is treated as an *F* in computing the grade point average.

Table 1
Grade Distribution for Biology 10 Students

Grade	Enrolled in EDSE 10	Percentage	Not Enrolled	Percentage
A	6	20.0%	38	15.3%
B	9	30.0%	64	26.1%
C	12	40.0%	103	41.4%
D	2	3.3%	16	6.4%
F			1	.4%
U			10	4.0%
W	1	3.3%	11	4.4%
Inc			5	2.0%
Totals	30	100%	248	100%

An analysis of the results of the testing indicates that of the 30 students enrolled in adjunct coursework, only two students received a *D*, and one student withdrew from both the class and Biology 10 because of his outside job. Thus, there was a total of 10% who did not pass the course with a *C* of higher. Among the students who did not enroll in EDSE 10, 17.2% received grades of *D* or *F* or otherwise failed to complete Biology 10. An assumption can be made that the extra effort which the students put out through enrollment in the adjunct class enabled them to obtain better grades and/or complete Biology 10.

Discussion with the Biology instructor revealed that his analysis of the student dropout and failure rate centered on two factors: (1) the Biology 10 course attracted large numbers of ESL students who were ill-prepared for the complexity of the language in the lectures and the textbook, and (2) its attraction for working students who were unable to put enough time into studying for the class.

Nearly two-thirds of those choosing the adjunct course were ELS or minority students. Table 2 gives an analysis of their grades. It shows that the ESL and minority students received 4 of the 6 *A*'s among the 30 adjunct students, 6 of the 9 *B*'s, 10 of the 12 *C*'s, and both of the *D*'s; the one student who withdrew from the class was a Black student. Among the 43 students who received *D*'s or the *F*, or who did not complete the Biology 10 coursework or enroll in the adjunct class, 23 were ESL or minority, and 20 were Caucasian. Self-report from among the students in the adjunct class revealed that 27 or the 30 had jobs which required them to work an average of 20 hours per week.

Table 2

Grades in Adjunct Class

Grade	ESL and Minority Grades	Caucasion
A	1	2
B	6	3
C	10	2
D	2	
W	1	
Total	23	7

Another interesting phenomenon was the fact that the students who enrolled in the adjunct class for two units made lower grades than those in the one unit section. Of the 10 students enrolled for the two units, 3 received *B*'s, 6 received *C*'s, and 1 student withdrew. Self-report from the students who enrolled in the two-unit section indicated that they selected the two-unit section because they were fearful of the level of their skills and believed that, since a two-unit course required more commitment, they would be better prepared to survive in the course.

Conclusion

Analyses of the grades for students enrolled in the adjunct class showed that they were higher than those of students not enrolled in the class, whether they were recommended to take the class or elected it as "extra insurance." Further analyses comparing these two groups will be made. They can be obtained from the authors by writing to them in care of the Special Education Department at San Jose State University.

REFERENCES

California State University Chancellor's Office. (1983). *Promises to keep.* A report on remedial programs in the California State University system. Long Beach, CA.

THE ROAD MAP: AN ORGANIZATIONAL APPROACH TO STUDY-READING CONTENT MATERIAL

Mary B. Hess
Ricks College

For nearly forty years the SQ3R system of study-reading, or some variation of it, has been included in most study-reading skills books. First developed by Robinson to aid World War II servicemen learn new tasks, SQ3R has remained popular ever since. Despite its weakness of being what might be considered a passive process, that is, a mental, not a psychomotor process, the SQ3R method is still considered a favorite by skills experts as well as authors (Maxwell, 1979; McWhorter, 1986; Smith, 1981; Thomas & Robinson, 1977).

Recognizing the need to go beyond the passive process of mental reflection in SQ3R, Donald Smith (1961) added a fourth *R*. This is a step which required the student, using only cue words (p. 16), to *Rite* both the question and the answer.

It is this expanded version and variations that may be found in many current study-reading manuals. Yuthas and Smith-Gold (1982) recognized the importance of the writing component to the study procedure and directed the student to write the important points as a review of each section. Walter and Siebert (1976) have combined writing with recitation in their study formula, directing the student to write a brief summary of what was recited.

Rationale for the ROAD MAP

While the SQ3R and SQ4R, together with their variations and modifications, have provided success for numerous students, some basic principles of learning are overlooked by a majority of students using these systems. Association and organization are two learning principles not emphasized in the traditional systems of study-reading. To be meaningful, any new information to be learned must be associated with prior learning and knowledge. A second principle of learning and retention is organization, the ability to see relationships of ideas and organizational structure in the selection read and the material to be learned (Frandsen, 1961).

The above weakness was first observed in 1969 when this author attempted to find out why so many college students did not reflect a measurable improvement in their textbook reading comprehension. It was noted that, although the students applied the SQ3R, and later the SQ4R system, they were learning in a segmented fashion. When a student attempted to recall the concepts and ideas collected during reading, only a "basket full" of isolated facts was retained. It was found that in-depth learning took place only when the student could perceive a relationship between ideas and concepts and could organize those ideas into a graphic representation. It was then that an organizational approach to content material reading was first devised. Through the stages of experimentation, a number of different graphic formats were found to aid the students in the organization of their textbook material. Also, it was found that certain graphic formats were more appropriate for organizing certain kinds of materials.

In 1971, Hanf introduced his technique of "mapping" as a substitute for outlining and note-taking. As a technique of structuring information in graphic form, the format was developed as a spin-off from the traditional sentence diagram. While Hanf's system of mapping has been extensively adopted, it represents only one graphic format for organizing all types of content material. More recently the term "mapping" has been used in reference to other forms of graphic representation (Cohen & Poppino, 1982; Phillips & Sotiriou, 1982).

The use of graphic or visual representation for guiding students in the learning process has been suggested by several other authors. Ausubel (1968) recommended the use of what he called "advanced organizers," visual structures of known concepts constructed by the teacher to guide the student in relating new concepts to the known concepts. In 1969, Barron developed a technique for developing a visual representation of content and cognitive structure. His "structured overview" spotlights key vocabulary, which represent the important concepts (Thelen, 1976, pp. 12-17). Use of the structured overview for technical terms and key vocabulary has been described by Thelen, Earl (1976), Vaughn (1982), Alvermann (1982), Vaughn and Estes (1986), and Devine (1986).

One of the weaknesses of the advanced organizer is that it is constructed by the teacher, allowing the students only a passive observation of the teacher's presentation of the overview. Barron discovered that the key to success in the reading/learning task was student involvement. When the students constructed their own structured overviews they achieved higher test scores than those who simply followed the overviews constructed by the teacher (Vaun & Estes, 1986, p. 168). Following Barron's example of student involvement, Vaughn developed his "ConStruct" (concept structuring) procedure,

which included the construction of a graphic post-organizer. This graphic organizer is built by the student in three phases, one for each of three readings of a selection: first, a rapid survey-type reading; second, a careful study-type reading; third, a re-examination for additional meaning (Vaughn, 1982).

The advanced organizer, structured overview, and graphic post-organizer all resemble each other in their emphasis on key words and technical vocabulary. Another similarity of the three procedures is the graphic design, which resembles a pedigree or administrative flow chart, starting at the top with the major topic, branching off to the principal supporting ideas, and finally identifying the supporting details, each identified by key words. The format of the structured overview and post-organizer is limited and allows little variation needed for different kinds of content material.

Little has been written concerning the value of eidetic imagery as an aid to retention and recall of information. While it is important that a student can visualize concepts while reading, it is equally helpful to recall eidetic images of the material to be remembered. This is an aspect of learning that has been omitted in the use of any of the procedures described above, but it plays an important role in the ROAD MAP. By organizing the questions and answers into a graphic representation, specifically fitted to the material to be learned, the student is able to visualize the concepts as well as mentally program an eidetic image of the chart or graphic. Both the visual image of the concepts and eidetic imagery of the organized information are important in the principle of retention and recall. Adding to this the principles of associative relationship and organizational patterns, it has been found that students not only reflect improvement in reading comprehension, but also delayed recall of information. As the relationship of central ideas, concepts, and supporting details is perceived, the student facilitates eidetic imagery and recall while charting and putting into graphic form the material read.

The ROAD MAP As an Organization Approach to Study-Reading

A map to guide a traveler on his journey can help him see where he is going, how far he has to travel, what kinds or roads he will be traveling, and in what areas he will be traveling. The ROAD MAP to reading (See Appendix) provides the same kind of direction for a student. It is a series of techniques which can effectively guide the reader toward improved comprehension, concentration, and retention. It meets those basic principles of learning: association and organization to show relationships. Large amounts of information can be con-

densed in a well organized graphic while at the same time facilitating eidetic imagery in the mind of the student. The ROAD MAP is not a method of speed reading and will not spontaneously increase the reader's words-per-minute rate of reading. It will, however, eventually increase the rate of comprehension, thus reducing the time required for comprehending a textbook assignment. Students soon learn that all types of reading should not be done at the same rate but that they must determine the rate by the difficulty of the material and the purpose for reading.

In approaching a reading assignment, it is important to determine the length of the assignment and thus gage how the assignment should be divided for study periods. The student is then ready to follow the ROAD MAP.

Rapid Overview

The rapid overview of a chapter involves a careful examination of the title and subtitles, reading the introductory paragraphs, skimming the topical headings and subheadings, examining pictures, charts, and other graphic illustrations which may serve as road signs. These provide clues to the organizational structure of the chapter and its subdivisions. The rapid overview should also include a reading of the chapter summary, if such is provided. Otherwise, the final paragraphs, which usually summarize the main points of the chapter, should be read as part of the overview. Topical headings and subheadings specifically provide clues to the author's organizational pattern and expand upon the basic framework of the chapter. (The Table of Contents may also provide organizational clues.)

Organize Questions

To focus attention on meaning, questions should be generated by the reader during the initial rapid overview or immediately following. The chapter title should be turned into questions: "What does it mean?" "What general areas and major points will it cover?" "How does this relate to previous chapters?" For greater comprehension and effectiveness, the questions should be written to provide a structured and organized set of directions for reading. Some questions can be formulated simply by turning the topical headings and subheadings into questions. Where an organizational pattern is readily discernible, the questions may be a part of the student constructed graphic to be completed as the student reads and locates the answers.

Formulating questions is not difficult if the author has provided specific headings and subheadings which can be shifted into questions. However, some types of expository material do not lend themselves to easily formulated questions. Materials in which major divisions are vague, topical headings are limited, or an organizational pattern is not evident, questions can be generated from the topic sentences, bold print, or italicized words, lists, and other typographical clues. "What does this word mean?" "What are the steps to...?" These in turn lead to the possibility of a graphic. Some subject matter lends itself to certain stock questions which can then be organized into a graphic. For example, pre-reading questions in literature can involve the reader in the action of a novel or short story, thus providing purpose for reading. Stock questions which can be developed into a graphic might include: "What is the title, and who is the author?" "Who are the principal characters, and what are their roles?" "When and where does the story take place?" "What is the plot?" "How is the climax reached?" (Figures 1 and 2).

Although the student may formulate questions from topical headings and other clues concurrently with the initial rapid overview, the student must continually adjust questions during reading, add questions, or reword questions to gain greater depth.

Approach With a Purpose

With a set of well organized questions, the reader is ready to approach the reading with a specific purpose in mind: that of locating the answers to those questions and completing the graphic by writing the paraphrased and condensed answers in the appropriate places of the chart or diagram.

Determine Rate

The reader should consider the question of what is to be looked for. Reading then should be directed to a search for answers. According to the student's purpose and the difficulty of the material read, the student's rate will need to be adjusted throughout the reading: skim some paragraphs to get the main thought; scan passages until the answer is found; then slowly and carefully read the important points of the answer.

Micro-mini Paraphrase

By paraphrasing the author's ideas into a condensed micro-mini "nutshell" statement, then *writing* the paraphrased answers and statements in a logical sequence, order, or graphic, the student will use a multi-sensory learning modality providing for long term learning. In order for the student to mentally program the information effectively, it is essential to write, not type, the chart or graphic. Where the student has already identified an organizational pattern appropriate to the material, the "nutshell" statement can be written on the chart or graphic. The chart then serves as a study guide for reading. If an organizational pattern is not readily discernible, the key words of the major point and answers to the questions should be underlined, rephrased and condensed into a brief marginal note for later organization into an appropriate graphic.

Association and Organization

As has been stated, in-depth learning takes place when the student can perceive a relationship of ideas and concepts and can organize those ideas in a chart, diagram, or graphic to show the total framework. Such a system of structuring information facilitates eidetic imagery, which provides a mental image of the chart, or graphic, for later recall. While not all information is easily organized in graphic representation, there is a type of graphic in which most content material can be organized, the type of graphic used depending upon the subject matter and extent of detail.

Basic data table chart. This type of chart (Figure 1) can show large amounts of information in condensed form and has greater general usage than any other graphic. Such a chart can be used to give additional information concerning the related variables under study. It can be used to identify categories and classifications, technical terminology, works of art, literature, music, noted persons, law cases, and numerous other areas of the curriculum. The questions indicate how each column will be labeled. The related variables then are listed in the first column to the left.

Summary Chart of Literature

Title	Author	Characters	Setting	Time	Plot

Figure 1. A basic data table chart showing how literary information may be organized and used as a study guide.

Single variable data chart. This shows at a glance the pertinent information concerning any one variable: a historical period, a significant personality, individual works of art, a novel or piece of literature (Figure 2). Such a chart can serve as a study guide to direct the student's reading. It shows organized data which in condensed form can feed into a basic table chart.

Charting a Novel or Short Story

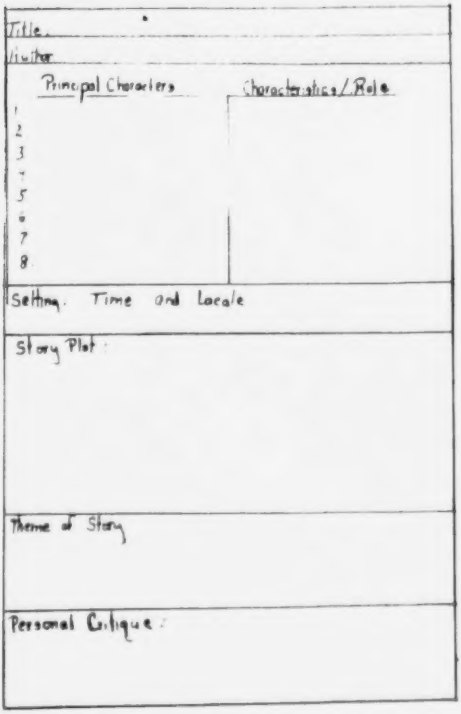


Figure 2. A single variable data chart which can serve as a study guide to organize pertinent information about a literary selection.

Time-line chart. Time lines focus on the chronology or sequence of events (Figure 3). The sequence of certain data, such as child development or important personalities, can be organized chronologically on a time line as well as combined with a basic data chart to give more detail. This graphic can be used in such areas of the curriculum as music, art, and literature to show the time sequence of the different ages or periods. It can be used in a study of leaders in the various fields or in the development of styles through the different eras.

Time-Line Chart of Architectural Periods

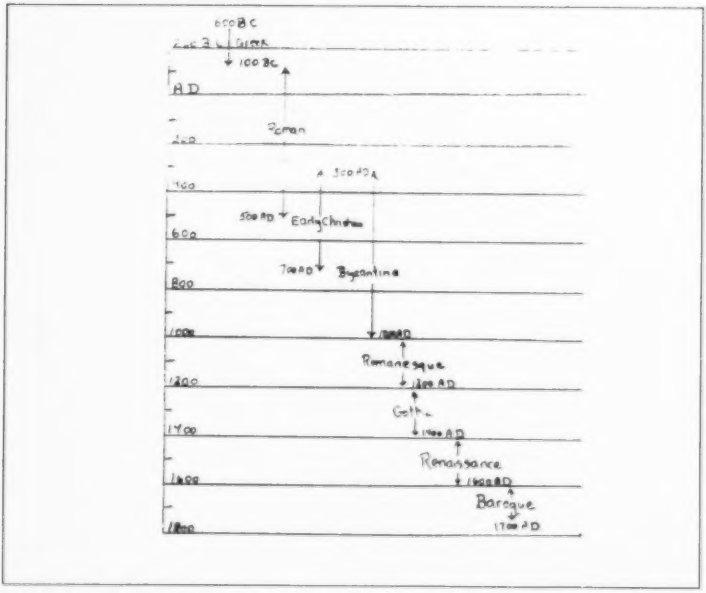


Figure 3. A time-line chart showing how this type of graphic can depict the evolution of style through different periods.

Spider chart or wheel. Referred to by some as a map, the spider chart shows the relationships or levels of primary and secondary supports to the main idea, the hub of the wheel. This format is excellent for the organization or information concerning one variable (Figure 4). This type of graphic facilitates the organization of information in biology, the humanities, in any subject where one item or person is under scrutiny. The hub, or body, shows the main topic and central idea, and by adding the levels of support, the map is completed.

Spider Chart

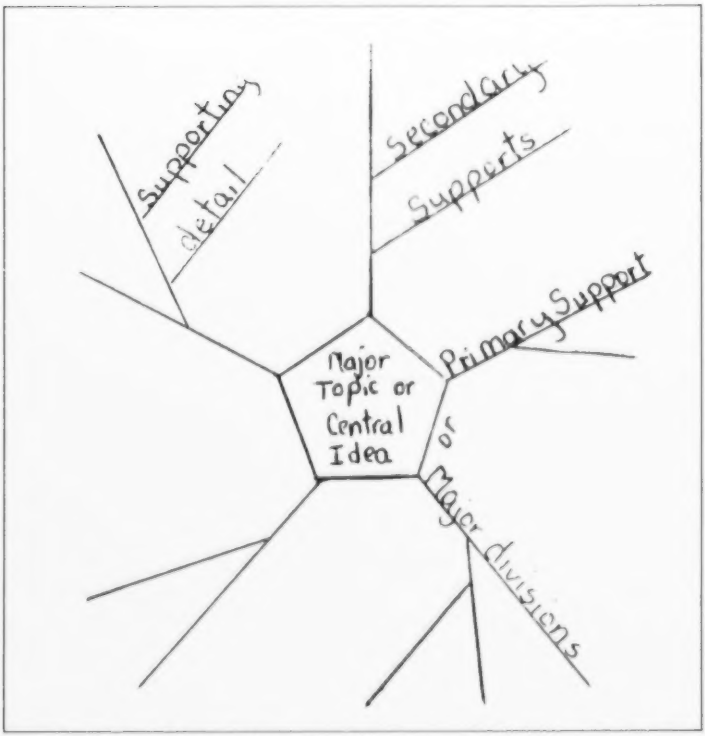


Figure 4. The spider wheel chart shows the relationships of primary and secondary supporting ideas to the main idea.

Cycle chart. Steps involved in any sequence or process can be organized in a process chart. Some processes can be graphically depicted in a cycle chart to show how the process returns to its point of origin (Figure 5). This type of structure can be extremely helpful in business and economics, the social sciences, as well as the different branches of the physical and biological sciences.

Phases of the Moon

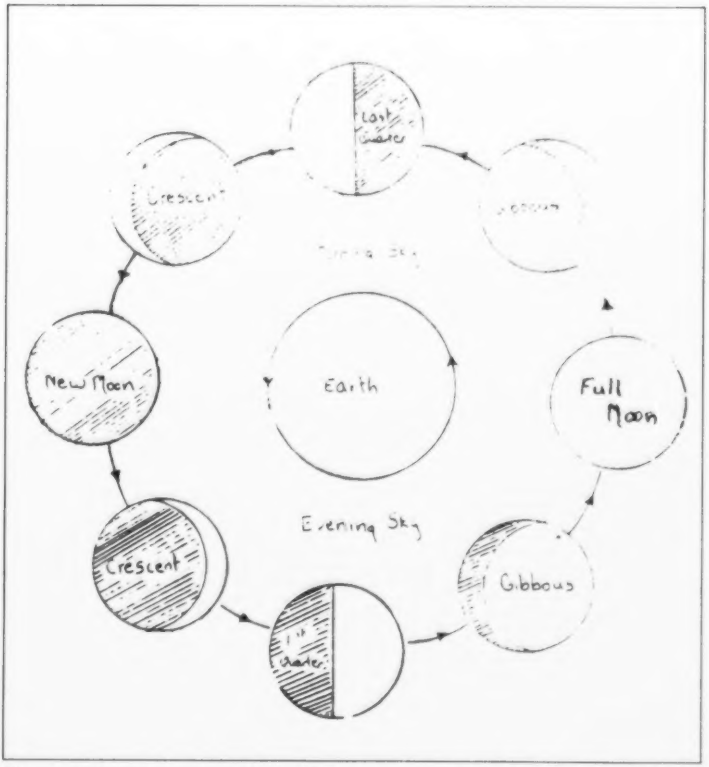


Figure 5. A cycle process chart showing how a process returns to its point of origin, this chart showing the phases of the moon.

Straight process chart. The simple flow or straight process chart reflects the steps involved in a process that has a point of completion, rather than returning to the point of origin (Figure 6). Such data can be represented by both a diagram and a simple sequence of stages. Any area of the curriculum that involves sequential steps: (home economics, automotives, computer science and mathematics, as well as the physical and biological sciences) can be graphically represented in this type of chart.

Process in Stimuli Transmission

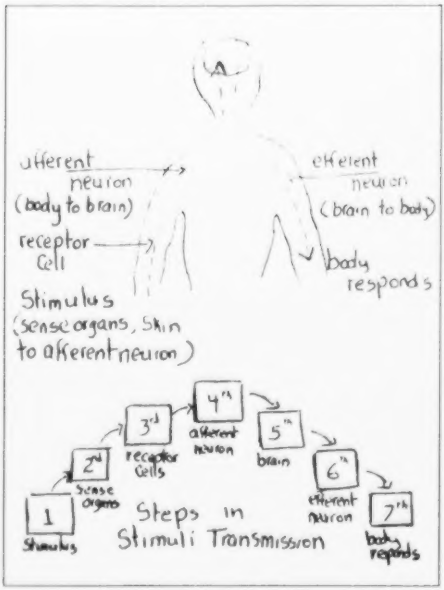


Figure 6. A diagram and a simple or straight process chart, both showing the same process of stimuli transmission through the afferent and efferent neurons, two graphic representations of the same information.

Classification chart. This type of chart is a modification of the basic table chart and can be used with any information which calls for categorizing, classifying, or comparing (Figure 7). This type of chart lends itself well to physiology and anatomy, biology, physics, geology, philosophy, and many other areas of the curriculum which involve comparisons or classification.

Classificaton of Body Tissue

Connective Tissue	Muscle Tissue	Nerve Tissue	Epithelial Tissue

Figure 7. A classification chart may be helpful in the study of physiology and anatomy as well as other areas of the curriculum, this example showing how tissue is classified.

Hierarchical or administrative flow chart. A hierarchical sequence, such as is found in the organization of business management, may be structured in an administrative flow chart (Figure 8). Such a graphic shows immediately the levels of the hierarchy. This type of chart is used extensively in business and economics, political science, genealogy, and in areas of the curriculum to show origin of concepts.

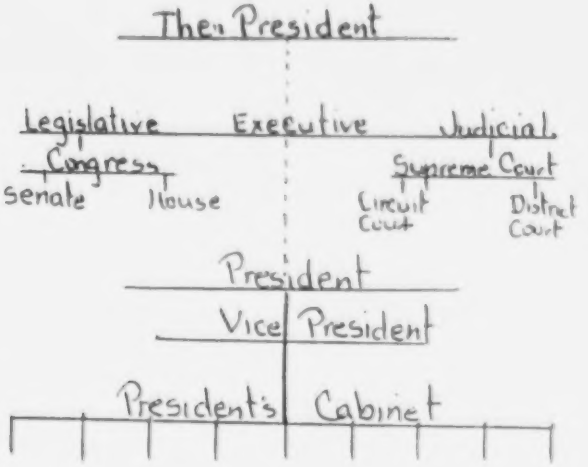


Figure 8. A hierarchical or administrative flow chart showing the organizational structure of the United States government.

Program the Human Computer

The efficiency with which a student can recall important information reflects the degree to which the information has been mentally programmed. This is done by reproducing the graphic that was developed during the initial study-reading, using eidetic imagery to reinforce recall ability. A recall chart should be made immediately after the selection has been read and the initial chart has been completed.

The recall chart provides a self-test of the material studied and identifies the areas missed by the omissions or gaps on the chart. By filling in the "forgotten" information with a bright, prominent color, the student is able to recall the eidetic image of the data which has been highlighted with a different color. The information associated with the bright color is easier to recall.

In summary, the purpose of the ROAD MAP is to guide the direction of the student's reading and provide a framework within which information and ideas can be organized. Looking for specific information will improve concentration and thus comprehension. To program information and ideas from a textbook to one's mind for later recall, such ideas must be paraphrased, reduced to micro-mini form, and organized into a graphic representation. It is the process of rephrasing, recording, and organizing to show relationships that provides the "input" to the brain, permitting such information to be more readily available when called for.

REFERENCES

Alvermann, D.E. (1982). Restructuring text facilitates written recall of main ideas. *Journal of Reading, 25,* 754-758.

Ausubel, D.P. (1968). *Educational psychology: A cognitive view.* New York: Holt, Rinehart and Winston.

Cohen, E.L., & Poppino, M.A. (1982). *Discovering college reading, thinking, and study skills: A Piagetian approach.* New York: Holt, Rinehart and Winston.

Devine, T.G. (1986). *Teaching reading and mathematics.* Newark, DE: International Reading Association.

Frandsen, A.N. (1961). *Educational psychology.* New York: McGraw-Hill.

Hanf, M.B. (1971). Mapping: A technique for translating reading into thinking. *Journal of Reading, 14,* 225-230; 270.

Maxwell, M. (1979). *Improving student learning skills.* San Francisco: Jossey-Bass.

McWhorter, K.T. (1986). *College reading and study skills.* Boston: Little, Brown and Company.
Phillips, A.D., & Sotiriou, P.E. (1982). *Steps to reading proficiency.* Belmont, CA: Wadsworth.
Robinson, F.P. (1970). *Effective study.* New York: Harper & Row.
Smith, B. (1981). *Bridging the gap: College reading.* Glenview, IL: Scott Foresman.
Smith, D.E.P. (1961). *Learning to learn.* New York: Harcourt, Brace and World.
Thelen, J. (1976). *Improving reading in science.* Newark, DE: International Reading Association.
Thomas, E.L., & Robinson, H.A. (1977). *Improving reading in every class.* Boston: Alyn and Bacon.
Vaughn, J.L., Jr. (1982). Use the ConStruct procedure to foster active reading and learning. *Journal of Reading, 25,* 412-414.
Vaughn, J.L., Jr., & Estes, T.H. (1986). *Reading and reasoning beyond the primary grades.* Boston: Alyn and Bacon.
Walker, T., & Siebert, A. (1976). *Student success, how to be a better student and still have time for your friends.* New York: Holt, Rinehart and Winston.
Yuthas, L., & Smith-Gold, D.A. (1982). *Reading and other college survival skills.* Dubuque, IA: Kendall Hunt.

AUTHOR NOTES

The figures in this paper have been constructed to show the informality of student constructed graphics. An important principle of the ROAD MAP procedure is to write, not type the graphics. Some informal research has been conducted by the author with students at Ricks College, comparing the effectiveness of typed with handwritten graphics. The findings verified the importance of student constructed and handwritten charts to effectively "program" the eidetic image for adequate recall.

APPENDIX

The acronym, ROAD MAP, represents the procedural steps of the organizational approach to study-reading.

R — *Rapid overview of the chapter*

1. Examine the title, subtitles, and topical heading of the selection.
2. Examine all graphics, charts, illustrations, diagrams and their captions.
3. Read the first and last paragraphs and chapter summary.
4. Skim the principal paragraphs, the body of the chapter.
5. Identify the author's organizational pattern of the chapter.

O — *Organize questions*

1. To be formulated by changing topical headings and subheadings to questions during the rapid overview.
2. To be written in an organizational pattern to show relationships.
3. General questions include:
   a. What are the main ideas?
   b. How do they fit into an organizational pattern?
   c. What are the relevant supporting details?
4. Specific questions include:
   a. What is it about? What does it mean?
   b. How does it relate to previous knowledge?
   c. How does it fit into an organizational pattern?
   d. Why is it important?

A — *Approach reading with a specific purpose*

1. The main purpose, to find the answers to the questions that have been posed.
2. Is the purpose of the reading
   a. to get an overall picture or general impression? Skimming.
   b. to retain main ideas and important details? Study-reading.
   c. to locate specific data? Scanning.
   d. for relaxation and pleasure? Rapid or average reading.

D — *Determine rate according to purpose*

Specifically, What is being looked for? Reading should be directed to a search for specific answers.

1. Skim the introductory and concluding paragraphs and chapter summary to locate key ideas and concepts.
2. Study-read to comprehend important concepts and supporting details.

3. Scan for more answers to questions as well as for specific data.
4. Rapid read the easy, familiar material.

M — *Micro-mini paraphrase answers to questions*

1. A condensed paraphrase of the author's key concepts, answers to questions, should be written in marginal notes.
2. Organize the paraphrased statements in an organizational pattern or structure.

A — *Association and organization, keys to learning*

1. Key ideas should be organized into charts, diagrams, and graphics to show relationships.
2. Charting information shows the total framework and related details.
3. Construction of charts, diagrams, and graphics facilitates eidetic imagery for recall.

P — *Program the human computer*

1. Recall the eidetic image of the graphic.
2. Reproduce the chart or graphic from eidetic imagery.
3. Fill in omissions on the recall chart in contrasting colors.
4. Repeat the "programming" step as necessary.

PREPARING FOR THE YEAR 2001 EMERGING CHALLENGES: OPPORTUNITIES FOR RENEWAL

Jennie Spencer Green
California State Polytechnic University

Buenas tardes. Es un placer para mi estar con ustedes esta tarde. (Good afternoon. It is a pleasure to be with you this afternoon.)

I sense the spark of enthusiasm, collegiality, and good will that has been generated over the last three days. I am delighted to share in this, your 19th Annual Conference. I am one of the fortunate professionals who has had the opportunity to have worked in institutions in the East-Philadelphia, Pennsylvania, in the Midwest-Boulder and Denver, Colorado, and now here in the West, California. I, therefore, feel a professional kinship with each of you present in this room.

Last week I participated in the Western Regional Conference of the NAACP. I heard a story there containing words of wisdom, which I will transfer from theory to practice in the delivery of my remarks today. The story, briefly summarized, follows:

> One Sunday morning a minister, after delivering a rousing, emotion-filled sermon, asked for feedback from members of the congregation. He asked, "Which part or passage of my text did you most enjoy?" They responded, "The last passage-the one from the pulpit to your seat!"

With that in mind, on this glorious sunny Sunday afternoon, I'll be brief, and in a few minutes, back in my seat.

As I reviewed your program, I was impressed with the number of presentations focusing on holistic themes for learning and life enrichment, such as physical health, nutrition, stress management, accommodating ethnic and linguistic student diversity, peer tutoring, the use of technology, and information processing.

This afternoon I would like to focus on what I perceive are emerging challenges and opportunities for renewal as we approach the year

2001—in a challenging, dynamic, societal context where the perennial debate—education for the intellect versus education for social adjustment—continues as if we could or should choose, as Arthur Coombs once said, "between smart psychotics or well-adjusted dopes."

Emerging Challenges

Challenge One: Demographics

The first challenge, changing demographics, can be illustrated by analyzing data from a recent survey conducted by the Carnegie Foundation (1984) and by review of the contents of the report *Involvement in Learning: Realizing the Potential of American Higher Education* (1984). Data revealing the shift in the composition of the student body indicates that three out of five American high school graduates now enroll in college. Indeed, the United States has outdistanced all other industrialized nations in the proportion of its young people who participate in higher education. Equally important is the diversity of these students: (1) more than half of all undergraduates are women; (2) one out of six is a member of a minority group; (3) two out of five are over the age of twenty-five; (4) fewer than three in five are now attending college full time.

Here in California many perceive our challenge, throughout the entire educational system, to be that of enabling youth, representative of diverse racial, cultural, ethnolinguistic and socio-economic backgrounds, to acquire the basic literacy and computational skills, as well as the personal qualities which will enable them to become first-class citizens. California's minority population is increasing more rapidly than forecasted. In 1984, minority enrollment in K-12 was 47%. We will surely reach the 50% mark long before the year 2000. Still, 1984 California Post Secondary Education Commission (CPEC) findings revealed that only 10% of Blacks and 15% of Hispanics were eligible for admission to institutions within the California State University System (CSU) as compared to 30% of White students.

In *Illiterate America* (1985), Johnathan Kozol suggests that many Americans of diverse linguistic and socio-economic backgrounds are illiterate and/or under-educated in relation to their intellectual potential. The statistics on illiteracy are in the millions; given the need for a literate citizenry to ensure the continuance of a democratic society, these figures are alarming. Access to higher education must continue to be extended to the many—not the few. Many of you here today remember the programs of the 1960's and 1970's which enabled non-traditional populations to gain access to higher education. The challenge of the future will continue to be that of reducing rates of

attrition, drop-out, and discontinuance of non-traditional students—precisely the on-going challenge which your programs and services have been traditionally designed to address.

Challenge Two: Nature of Learner

A second emerging challenge is best described by what I refer to as the phenomenon of **daring to motivate and inspire**, albeit to **teach the detached, aloof, uninvolved learner**. Here in the "Land of LA—LA"(Los Angeles), I encounter an increasing number of laid-back, mellow, cool, relaxed learners who challenge me to transform them into erudite scholars with as little effort as possible on their part. These students often exude vibes such as, "Lecture to me all day, but do not embarrass me by calling on me for feedback or synthesis." In the computer laboratory, they are most adept at requesting, "Show me where the software is; show me how to figure this problem out—I will learn the concept later." Our challenge is to inspire, motivate and improve the many who exhibit these characteristics. It is important that we encourage all students to take full advantage of our services. We must, therefore, set in motion marketing strategies which suggest to students that the potential and ability to succeed lie within each of them. We must clearly communicate the message that we are here to assist students to help themselves become effective learners. While faced with the challenge to address the needs of increasingly diverse populations to acquire knowledge, to increase their capacity to analyze issues, to synthesize information, and to engage in creative problem solving, we must also begin to creatively envision new ways to deliver different services.

Challenge Three: Serving Diverse Populations

Many speakers of English as a second language are most adept at acquiring proficiency in the usage of the receptive skills of the English language through language laboratories and computer software; however, proficiency in the ability to articulate and engage in active discourse with native English speakers is not fully developed. Subsequently, many students, particularly of Asian language backgrounds, opt to enroll in courses and pursue careers that require a minimal amount of cognitive academic language proficiency (Cummins, 1981). As the enrollment on college campuses across the country continues to reflect the diverse nature of our society, we must begin to identify and put in place technologies that are responsive to basic interpersonal and cognitive academic linguistic proficiency needs.

Opportunities for Renewal

As you prepare for the year 2001, I suggest you ask personally, and professionally as an organization, do you desire to exist in the future as you do today? Will the types of programs and services you provide today be viable, or needed, services? In times of shrinking resources, budgets for special programs are likely to be reduced, combined, or omitted. Ask yourself which programs are likely to be cut? Those serving few students or those demonstrating the ability to continually adapt and expand to serve the needs of the many students. You have a golden opportunity now to refocus and rethink your mission. What have you accomplished? What new ideas—directions—might you consider?

Opportunity One: Organizational and Program Change

The report on *Involvement in Learning: Conditions of Excellence in Undergraduate Education* (Carnegie Foundation for the Advancement of Teaching, 1984) strongly recommends that course offerings and services to students be based upon the research on human growth and development. Programs should be designed to incorporate active modes of learning. Strategies such as peer tutoring hold great potential and require that students be creators as well as receivers in the learning process. As many of you well know, students are more apt to learn content when they are engaged in it.

In the future, we will be also challenged to design and use learning technologies to increase rather than reduce the amount of personal contact between us and the students we serve. Since no factor seems to account for student learning and satisfaction more than faculty contact (Carnegie Foundation Survey, 1984), we as professionals must be concerned about the recent trend toward use of technology and delivery systems that have the potential of reducing significant intellectual contact between faculty and students, thereby removing the passion from learning.

Opportunity Two: New Directions for a Global Society

Senator Paul Simon, in *Tongue Tied America* (1980), promotes a language policy for the U.S. Simon's view is that the inability of our citizens to communicate in languages other than English contributes to our social, cultural, and economic isolation from the world community. This situation threatens our national security, harms U.S. international trade, and thus domestic economy, and presents a political threat to peaceful relations and understanding with other nations and cultures. In response to this challenge lies a golden opportunity which, in turn, requires a shift in thought and creativity.

For college students to be able to personally and professionally function in a global community in the 21st century, new ways of offering second language experiences must be explored and implemented by collaborating with colleagues in foreign languages, English-as-a-second-language, business international education, and computers in the design of innovative delivery systems.

Opportunity Three: Renewal of Human Resources

The renewal of programs and the creative redirection of services can best be achieved by infusing into your programs the concept of $E=MC^2$, enthusiasm equals motivation that is contagious. To those of you who are directors of programs, I submit the following for your consideration. In order to maximize the potential for renewal of staff, seek to create an ambiance where people are acknowledged for their contribution, encouraged to dream, and free to innovate.

Tim Peters and Nancy Austin, in *A Passion for Excellence* (1985), suggest that effective leaders manage by walking around, keeping in touch with the pulse of the enterprise (MBWA). In an educational context, frequent informal talks with staff, students, and faculty can provide meaningful input.

The extent to which each of us is willing to commit ourselves to renewal from within rather than responding to external forces (e.g., legislative mandates) is of extreme importance.

Conclusion: Commitment to Positive Growth

Perception plays an important role in how we define our individual and collective reality. Throughout my address, I have chosen to focus on emerging challenges and opportunities for renewal, for that is what I believe we have before us. In closing, I would like to share a personalized adaptation of an analogy used by a colleague, Dr. Eleanor Odden, at a recent staff development conference for teacher educators. I believe the contents will offer perspective on the challenges before us.

We can choose to envision the change, or renewal process, as climbing a mountain or caring for a bonsai tree. For those of you who are successful mountain climbers, you know it's best done with planning and with a group. It's also important to stop and assess how far one has climbed in reference to the starting point as well as to the summit. Needless to say, careful attention must be paid to the personal needs and skills of the team members. Flexibility, perseverance, and humor are essential to weathering the storms, enjoying the rain in anticipation of the sun.

For those of you who admire the external beauty of the bonsai trees which frequent the California landscape, I'd like to share that careful planning in the planting of the seed, cooperating with nature, careful attention paid to location, light exposure, and pruning are essential to the growth and artistic shaping of the bonsai.

The similarities between successful mountain climbing and the co-creation of the bonsai tree may be applied by each of us as we leave this conference and rededicate ourselves to personal and professional growth.

Choose to envision your students as you would like them to be—full functioning, literate, and capable of contributing to our dynamic world. Then, as the gardener of the bonsai, continue to water, adjust the light, prune, shape—they will grow and so will you.

I wish you health, happiness, and continued joy in your profession. . . Ciao, adios—Buena Suerte—Nos Vemos in Alberquerque!

REFERENCES

California Post Secondary Education Commission. (1984). An unpublished report on the state of post-secondary education in California.

Carnegie Foundation. (1986, February 5). College students: Who they are, what they think, 1984 Carnegie Foundation survey. *The Chronicle of Higher Education, 31* (21), 1, 27-31.

Carnegie Foundation for the Advancement of Learning. (1984). *Involvement in learning: Realizing the potential of American higher education.* Princeton, N.J.

Cummins, J. (1981). Four conceptions about language proficiency. *Bilingual Education, 5* (3), 31-45.

Kozol, Johathan. (1985). *Illiterate America.* New York: Anchor.

Peters, T., & Austin, N. (1985). A passion for excellence: The leadership difference. New York: Random House.

Simon, P. (1980). Tongue tied America. New York: Continuum.

Subject Index for
Journal of College Reading and Learning:
Volume XIX

ADDRESSES

Preparing for the year 2001 emerging challenges: Opportunities for renewal; Green, J.S., 123-128.

DEVELOPMENTAL EDUCATION

Prospects for improving higher education; Bogue, C., 70-77.

Multicultural

Identifying Native American learning styles; Wauters, J., Matlock, M., & Osborne, V.C., 36-50.

INSTRUCTIONAL AND LEARNING METHODS

Developmental writing courses: A vehicle for teaching writing across the disciplines; Austin, R., 87-90.

Reading students' invisible texts: Evaluating writing processes; Tomlinson, B., & Mortensen, P., 91-98.

The road map: An organizational approach to study-reading content material; Hess, M.B., 105-122.

LEARNING ASSISTANCE / ACADEMIC SUPPORT

Content Area Learning Skills

General vs. adjunct reading-study skills instruction for a college history course; Elliot, M.K., & Fairbanks, M., 22-29.

Reading, writing, and reasoning for health science majors; Cervi, P., & Schaefer, S., 59-63.

Adjunct coursework at San Jose State university; Sanidad, D., Sanidad, M.A., & Spalding, N., 99-104.

Study Skill Instruction

Moving the mountain to Mohammed: Study skills tutoring in the residence halls; Rogers, J.L., 1-11.

Memory models: Perspectives for study skills instruction; Mulcahy, P., 12-21.

A three-dimensional approach to test-taking instruction; Gibson, S.U., 51-58.

Teaching of problem solving skills; Bosworth, S., 64-69.

READING

Vocabulary

Creating a hierarchy of verbal analogy relationships: A beginning; Hopper, J.N., 30-35.

RESEARCH

Self-efficacy and reading achievement; Marsh, D.D., & Penn, D.M., 78-86.

Other WCRLA Annual Conference volumes available:

Fourth *Proceedings:*
Interdisciplinary Aspects of Reading Instruction $5.00

Fifth *Proceedings:*
Putting All the Cards on the Table $5.00

Sixth *Proceedings:*
Technological Alternatives in Learning $5.00

Seventh *Proceedings:*
Reading Update—From Ideals to Reality $6.00

Eighth *Proceedings:*
College Reading Skills: Today and Tomorrowland $7.00

Ninth *Proceedings:*
The Spirit of '76: Revolutions in College Learning Skills $7.00

Tenth *Proceedings:*
Personalized Learning Systems: Ecologies and Strategies $7.00

Eleventh *Proceedings:*
Learning Assistance: Charting the Course $7.00

Twelfth *Proceedings* $8.00

Thirteenth *Proceedings* $8.00

Fourteenth *Proceedings* $8.00

Fifteenth *Proceedings* $8.00

Sixteenth Journal of College Reading and Learning $8.00

Seventeenth Journal of College Reading and Learning $12.00

Eighteenth Journal of College Reading and Learning $12.00

Order volumes from
WCRLA
P.O. Box 4576
Whittier, California 90607

Make checks payable to:
the Western College Reading and Learning Association